HHS Public Access

Author manuscript

J Prim Prev. Author manuscript; available in PMC 2018 August 23.

Published in final edited form as:

J Prim Prev. 2016 June ; 37(3): 231–245. doi:10.1007/s10935-016-0418-7.

The Predictive Influence of Youth Assets on Drinking and Driving Behaviors in Adolescence and Young Adulthood

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Abstract

Drinking and driving among adolescents and young adults remains a significant public health burden. Etiological research is needed to inform the development and selection of preventive interventions that might reduce alcohol- involved crashes and their tragic consequences. Youth assets—that is, skills, competencies, relationships, and opportunities—can help youth overcome chal- lenges, successfully transition into adulthood, and reduce problem behavior. We examined the predictive influence of individual, relationship, and community assets on drinking and driving (DD) and riding with a drinking driver (RDD). We assessed prospective relationships through analysis of data from the Youth Assets Study, a community-based longitudinal study of socio-demographically diverse youth. Results from calculation of marginal models using a Generalized Estimating Equation approach revealed that parent and peer relationship and school connect-edness assets reduced the likelihood of both drinking and driving and riding with a drinking driver approximately 1 year later. The most important and consistent asset that influenced DD and RDD over time was parental monitoring, highlighting the role of parental influence extending beyond the immediate teen driving context into young adulthood. Parenting-focused interventions could influence factors that place youth at risk for injury from DD to RDD, complementing other evidence-based strategies such as school-based instructional programs and zero tolerance Blood Alcohol Concentration laws for young and inexperienced drivers.

Keywords

Youth; Driving; Alcohol; Injury; Parenting; Peers

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Compliance With Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Disclosures: The conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the Insamuch Foundation.

Introduction

Young people in the United States are drinking and driving less than in previous decades. Compared to 1991, when nationally 17 % of all high school students reported driving when they had been drinking alcohol (DD) at least once in the past 30 days, in 2013 only 10 % of high school students who drove reported DD. Riding with a driver who had been drinking alcohol (RDD) has seen parallel reductions (40 % in 1991, compared with 22 % in 2013; CDC, 2014b). State policies that change the environmental context of driving and make teens' default decisions the healthiest ones (Frieden, 2010) have contributed to this success. ''Zero tolerance'' blood alcohol concentration (BAC) laws for drivers aged \21 years reduce alcohol- involved motor vehicle crashes, and the minimum legal drinking age of 21 reduces alcohol-involved crashes and associated injuries among 18–20 year old drivers specifically (Shults et al., 2001).

Yet, drinking and driving among youth remains a public health burden. Motor vehicle crashes are the leading cause of death for youth ages 15–20 (CDC, 2014a), and in 2012 approximately one quarter of 15–20 year old drivers involved in fatal crashes had been drinking (NHTSA, 2014). Of these drivers, 86 % had a BAC of at least 0.08 %, the legal threshold for adult drivers (NHTSA, 2014). Etiological research related to the factors that influence DD and RDD can assist in identifying preventive interventions that can complement effective social policy to reach youth at highest risk.

Historically, prevention researchers have focused on variables that increase the likelihood of a motor vehicle crash, broadly termed ''risk factors'': for example, drinking and driving, nighttime driving, and teen passengers (Williams, 2003). Findings from the positive youth development field illustrate that youth assets—that is, skills, competencies, relationships, and opportunities—can help youth overcome challenges, successfully transition into adulthood, and reduce problem behavior (Oman, Vesely, Tolma, Aspy, & Marshall, 2010). Similarly to the manner in which assets have been conceptualized in other areas of adolescent injury (e.g., violent injury; Haegerich, Oman, Vesely, Aspy, & Tolma, 2014), a variable can be considered to be an asset when it directly decreases the likelihood of a motor vehicle crash (exerting a direct protective effect), or when it decreases the likelihood of motor vehicle crash in the presence of risk factors (a buffering protective effect; Lo¨sel & Farrington, 2012). For example, positive peer role models, parental monitoring, and school connectedness have been found to predict nonuse of alcohol (Oman et al., 2004). Similarly, parental monitoring is important in resisting physical fighting and weapon carrying (Haegerich et al., 2014). Assets can be developed individually as well as through family relationships, supportive organizations, and even social policy. By promoting bonding, fostering resilience, promoting social competence, enhancing self-efficacy, improving positive identity, and offering opportunities for prosocial development, assets can decrease many different problem behaviors in youth (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002).

Traffic safety researchers have investigated the influence of variables that are similar to the construct of ''assets.'' Peer influence has been found to impact DD (Evans-Whipp et al., 2013), DD and RDD (Chen, Grube, Nygaard, & Miller, 2008; Li, Simons-Morton, Brooks-

Russell, Ehsni, & Hingson, 2014), other risky driving behaviors (Scott-Parker, Watson, & King, 2009; Simons-Morton et al., 2011) and motor vehicle crash risk (Shope, Raghunathan, & Patil, 2003; Simons-Morton et al., 2011). However, the perspective has been more risk-focused (e.g., negative peer influence) than protective-focused (e.g., positive role models). It has also been reported that peer influence on drinking and driving can be mediated by parental monitoring. For example, findings from a cross-sectional survey of youth aged 15–20 indicated that parental monitoring helped prevent DD by reducing unstructured socializing with peers where drinking may occur and affiliation with peers who DD (Chen et al., 2008). Several longitudinal studies have illustrated that parental monitoring on DD or RDD persists over time. Bingham and Shope (2004) reported that less parental permissiveness and greater parental monitoring in the 10th grade indirectly predicted DD eight years later in young adulthood. The influence of parental monitoring is strong enough to predict DD, even after controlling for the influence of substance use (Li et al., 2014).

Although the effects of peer influence and parental monitoring have been examined previously, investigators have not yet fully examined the impact of youth assets at multiple levels of the social ecology simultaneously—that is, at the individual, relationship, and community levels. The social-ecological model of injury risk highlights the role of multiple levels of social organization in shaping development and risk of injury; all levels predict risk behavior and injury outcomes (Johnson & Jones, 2011). Further, research has mostly been risk-focused and cross- sectional, conducted with small non-representative samples. Our understanding of how youth assets influence DD and RDD through adolescence into young adulthood, and in the context of multiple levels of the social ecology, is limited. Understanding the influence of multiple social processes can better target primary prevention strategies to the factors that have the greatest impact.

This study addresses current gaps in the literature by assessing individual, family, and community assets employing a longitudinal design in a large diverse sample. Longitudinal models advance previous cross-sectional designs and allow for an understanding of what predicts DD and RDD as youth develop. Specifically, we examine the predictive influence of individual (aspirations, responsible choices), relationship (family communication, parental monitoring, positive peer role models), and community (school connectedness) assets on DD and RDD. We analyze both outcomes, as both compromise health and safety, and teens who ride with an impaired driver are significantly more likely to drive while impaired themselves at later time points (Li, Simons-Morton, Vaca, & Hingson, 2014). We hypothesize that individual assets and supportive relationships and community connections decrease the likelihood of DD and RDD over time.

We analyzed data from the Youth Assets Study, a community-based longitudinal study of Oklahoma City youth designed to prospectively investigate relationships among youth assets and drinking and driving/riding behaviors. Data were collected in five annual waves from youth and parent participants, beginning with the baseline survey in 2003/2004 and concluding in 2007/2008. Data from waves 3, 4 and 5 were analyzed. At wave 4, youth were aged 15–20 years; thus, we focused our analysis on youth of eligible driving age. At the time of wave 4 data collection, Oklahoma's minimum entry age for a learner's permit was 15'h years, the minimum age for driving while unsupervised was 16 years, and the minimum age

at which license restrictions could be lifted (e.g., nighttime driving and passenger restrictions) was 16'h, or 17 years without driver education (IIHS, 2013).

Method

Sampling and Data Collection

Census tracts in the Oklahoma City metropolitan area were stratified by income and race/ethnicity using 2000 census data, and 20 census tracts were randomly selected using a multi-stage process to recruit a diverse community-based study population in regard to race/ethnicity and socioeconomic status (see Oman et al., 2009, for a detailed description of the household and participant selection process). Youth ages 12–17 years who were living with a parent or guardian were eligible for the study. Also, participants had to speak English or Spanish, have sufficient cognitive functioning to respond to interviewer questions and complete the survey, and have no plans to move from the study area within the next 2 years.

We collected baseline data from the youth and their parents using Computer- Assisted Personal/Self-Interviewing (CAPI/CASI) procedures conducted in their homes by two-person interviewing teams. However, youth completed the risk behavior items themselves in private using computers equipped with sound files (.wav) and headphones to minimize any potential reading problems. These data collection methods were repeated for waves 2–5 except for those participants who had moved more than a 2-h drive from the metropolitan area. We conducted telephone interviews with these individuals and the youth completed the sensitive questions via a questionnaire administered over the internet.

A total of 1111 youth/parent pairs participated in the study, resulting in the response rate of 61 % using the criteria and formula suggested by American Association for the Public Opinion Research (Oman et al., 2009). Ninety-four percent of the participants were retained over the course of the study and 89 % (986 of the 1111 of the youth) had complete data from all 5 waves of the study. A total of 1053 youth/parent pairs were included in the analysis, excluding 43 youth who did not answer DD or RDD questions for either waves 4 or 5, and 15 youth who did not complete the wave 4 survey. The project was approved and reviewed annually by the IRB at the University of Oklahoma Health Sciences Center.

Measures

Demographics—We assessed demographic variables including youth age at wave 4, youth gender, youth race/ethnicity, parent education, and family structure. Race/ethnicity was self- reported by the youth and coded as non-Hispanic White, Hispanic, non-Hispanic Black, and non-Hispanic other. Parent education was coded as both parents having less than a high school education, at least one parent having graduated from high school, having a GED, or some college, or at least one parent having at least a bachelor's degree. Family structure was reassessed at each wave. At baseline, the response options were one- or two-parent household; at subsequent waves, the youth could respond ''independent'' if they had lived alone for at least 6 months. If a youth consistently reported a one-parent household, the time constant family structure variable was coded as 'one parent'; if youth consistently reported two- parent household, the variable was coded 'two parent'; for youth who either

reported both one and two parent over waves 1–4 or reported ‘independent’ before the age of 18, the variable was coded ‘inconsistent.’ (For youth who consistently reported one or two parent but then transitioned to independence at age 18, the variable was coded as the status the youth indicated prior to transition at age 18).

Youth Assets—We assessed six youth assets via youth interview data: general aspirations for the future (e.g., chances that when you are an adult you will be successful); responsible choices (e.g., you can identify the positive and negative consequences of behavior); family communication (e.g., how often you talk to mother/father about problems); parental monitoring (e.g., parents know where I am after school; if I am going to be home late I am expected to call my parents); peer role models (e.g., most of my friends stay out of trouble); and school connectedness (e.g., you feel close to people at school). The asset constructs were conceived, developed, and coded based on literature reviews and our previous research involving youth assets and youth risk behavior research (Kegler et al., 2005; Oman et al., 2002; see Oman et al., 2010 for a complete set of items). We assessed five asset constructs using four items, and assessed general aspiration of the future with three items. The items were assessed using a 4-point Likert scale. A score of three or higher for any item meant that youth responded, ‘‘usually/almost always,’’ or ‘‘agree/strongly agree.’’ To create a score for each asset, the items representing each construct were summed and divided by the number of items to create a mean asset score ranging from one (weaker asset presence) to four (stronger asset presence). The Cronbach’s alphas for the asset constructs ranged from .67 to . 83 (Oman et al., 2010). For analysis purposes, we dichotomized assets to reflect presence of an asset (with a score of three or higher for the construct, meaning that youth responded, ‘‘usually/almost always,’’ or ‘‘agree/strongly agree’’) or absence of an asset (with scores lower than 3). Most assets were missing on \1 % of youth. However, likely due to the aging of the respondents, parental monitoring was missing for a higher percentage of youth in later waves (wave 3: 5 %, 55/1030; wave 4: 12 %, 121/1020) who often skipped these but not other asset items. To avoid differentially excluding older respondents, we created a third level for the parental monitoring asset labeled ‘‘not applicable’’ (NA) to allow inclusion of youth who were missing data for the asset. Later in the tables, we display odds ratios comparing youth who responded that the asset was present to youth who responded that the asset was not present, and omit odds ratios comparing youth whose asset was NA to youth who responded the asset was not present, because these odds ratios were not significant.

Alcohol Use in Past 30 days—We assessed drinking alcohol in the past 30 days (referred to as ‘‘alcohol use’’ in the remainder of the paper) using an item from the Prevention Minimum Evaluation Data Set with the question, ‘‘During the past 30 days, did you drink any alcohol such as beer, wine or liquor?’’ (Brindis, Peterson, Card, & Eisen, 1998). The possible responses were yes and no.

Drinking and Driving (DD) and Riding With Drinking Driver (RDD) in Past 30 days—We assessed drinking and driving (DD) and riding in a car driven by someone who had been drinking (RDD) using items from the Youth Risk Behavior Surveillance System (Brener et al., 2013). The item assessing DD was, ‘‘During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?’’ The item

assessing RDD was, ‘‘During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?’’ The possible responses for both items were 0 times, 1 time, 2 or 3 times, 4 or 5 times, and 6 or more times. The response set for both items was recoded into a bivariate variable (0 times, 1 or more times) because of small cell sizes for some response options. Youth who reported ‘‘I do not drive’’ on a separate question assessing seatbelt use during waves 4 or 5 were excluded from the DD analysis for that specific wave.

Analytic Approach

We followed youth over the course of waves 3–5 of the study to determine if they engaged in DD or RDD at waves 4 and 5. We used marginal models using a Generalized Estimating Equation (GEE) approach to estimate the effects of the assets and alcohol use on DD and RDD while controlling for the influence of demographic variables. The GEE approach constructed marginal or ‘‘population- average’’ models. Youth age, gender, race/ethnicity, parent education, and family structure were time constant covariates. These factors were controlled in the analyses because previous research indicates they are associated with alcohol use, which in turn contributes to DD and RDD (Blum et al., 2000; Oman et al., 2004; Windle, 2003), and to isolate the effects of assets. We analyzed assets and alcohol use as time-varying and lagged (i.e., we tested the predictive value of assets and alcohol use assessed in wave 3 for DD and RDD assessed in wave 4, and assets and alcohol use in wave 4 for DD and RDD in wave 5).

We used a diagonal working covariance matrix as recommended by Pepe and Anderson (1994) when covariates vary over time. We used SAS version 9.4 to perform all statistical analysis. We used an alpha of 0.05 for main effects and an alpha of 0.01 for interaction terms. First, for each of the two outcomes (DD and RDD), we constructed seven initial models (one for each asset plus alcohol use) controlling for the potential confounders of youth age, gender, race/ethnicity, parent education, and family structure, regardless of p value. These analyses demonstrated the relationship between each variable and the outcome controlling for potential confounders. We evaluated all two-way interactions between the assets/alcohol use and the demographic variables in separate GEE models in the presence of all the factors controlled for in the analysis to determine if the relationship between assets/ alcohol use and DD or RDD was modified by the demographic variables. If significant interaction terms were found, we stratified the model by the interacting demographic variable. We also evaluated all two-way interactions between assets/ alcohol and wave to determine if the relationships between the assets/alcohol use and DD or RDD was consistent across waves. After interaction evaluation, for each outcome, we calculated a final model that included all potential confounders (regardless of p value) and assets as well as alcohol use variables that remained significant (a = 0.05) in the presence of the other variables. In the final model, we assessed two-way interactions between assets/alcohol use variables as well as the between assets/alcohol use and the demographic variables (as described above) using an alpha of 0.01. All available data were used for the analyses; given the small percentage and pattern of missing data, we did not impute missing data.

Results

Descriptive Results

The sample differed for DD and RDD analyses; only youth who indicated that they were drivers were included in the DD sample. A total of 1053 youth who provided data for at least two consecutive waves [waves 3/4 (n = 1030) or waves 4/5 (n = 1020)] were included in the larger RDD analysis. In wave 4, the point of the first outcome measurement for the analysis, the mean age of the participants in the RDD sample was 17.30 years and 53 % were female (see Table 1). Forty percent of the sample was non-Hispanic White, with the remaining sample 28 % Hispanic, 24 % non-Hispanic Black, and 9 % non-Hispanic other. Fifteen percent of the sample had both parents with less than a high school degree, 55 % had at least one parent with a high school degree, and 30 % had at least one parent with a college degree. For family structure, 58 % lived in two-parent households, 22 % in one- parent households, and 21 % in inconsistent households.

For the DD analysis,149 youth who reported not driving were excluded leaving a total subset of 904 youth who provided data for at least two consecutive waves [waves 3/4 (n = 885) or waves 4/5 (n = 874)]. The mean age for the 904 youth was 17.55 years; all other demographic data for this subset were within a percentage point of the data for the larger sample.

Table 2 presents the proportions of youth who reported possessing each of the assets and their alcohol use status in waves 3 and 4, and reported DD or RDD in waves 4 and 5. At least 88 % of the youth indicated at waves 3 and 4 they had the general aspirations for the future and responsible choices assets; relatively fewer youth indicated they had the family communication and peer role models assets (range = 55–65 %). Parental monitoring decreased from wave 3 (78 %) to wave 4 (68 %), partially due to more youth being coded as ‘‘not applicable’’ for this asset (see footnote on Table 2). In wave 3 and 4 respectively, 29 and 28 % possessed all six assets and 26 and 25 % possessed five assets. Alcohol use was reported by 36 % of youth in wave 3 and 45 % in wave 4. In waves 4 and 5, \20 % of youth reported DD whereas nearly 30 % reported RDD.

Initial Models

Four of the six assets were significantly and prospectively associated with DD (see Table 3). Youth who possessed any one of four relationship or community assets (family communication, parental monitoring, peer role models, school connected- ness) in waves 3 or 4 had significantly lower odds of reporting DD in waves 4 or 5 [adjusted odds ratios (*AOR*) range = 0.43 to 0.66] compared to youth who did not possess each asset. The parental monitoring asset was particularly protective for DD (*AOR* = 0.43). Alcohol use during the prior wave was strongly associated with DD (*AOR* = 4.62). No significant interactions were identified.

Five of the six assets were also significantly and prospectively associated with RDD (see Table 4). Youth who possessed responsible choices and any one of the four relationship and community assets (family communication, parental monitor- ing, peer role models, school connectedness) had significantly lower odds of reporting RDD (*AOR* range = 0.54–0.76)

compared to youth who did not possess each asset. The peer role models asset was particularly protective; youth who possessed this asset had significantly lower odds of reporting RDD (*AOR* = 0.54). As with DD, alcohol use during the prior wave was strongly associated with RDD (*AOR* = 3.75). No significant interactions were identified.

Final Models

After adjusting for the demographic variables and the other significant variables in the initial models, parental monitoring was the only asset prospectively associated with lower odds of DD (*AOR* = 0.58). Alcohol use during the prior wave strongly predicted DD (*AOR* = 4.18; Table 3). Similar effects for parental monitoring (*AOR* = 0.75) and alcohol use (*AOR* = 3.38) existed for RDD, with the addition of peer role models being prospectively protective for RDD (*AOR* = 0.68).

Discussion

Assessing the predictive influence of youth assets on motor vehicle crash risk behavior can identify social processes that are modifiable and can be promoted within prevention efforts —perhaps more easily than addressing personal or environmental factors that increase risk, such as driving ability (e.g., skill, knowledge) and the physical environment (e.g., nighttime driving, weather and road conditions, vehicle safety). Youth assets are important predictors of DD and RDD during adolescence and into young adulthood. Initial models illustrated that parent and peer relationship and school connectedness assets were associated with a reduced likelihood of both DD and RDD approximately one year later. After accounting for the six measured assets and alcohol use, the most important and consistent asset was parental monitoring, which reduced the likelihood of both DD and RDD at later points in time. Although parental monitoring has been shown to reduce risky driving behaviors among teens as they begin driving independently (Haggerty, Fleming, Catalano, Harachi, & Abbott, 2006; Simons-Morton, Ouimet, & Compton, 2008), relatively few studies have prospectively assessed the longer term effects of parental monitoring on young persons' driving behavior (Bingham & Shope, 2004; Li et al., 2014). This study confirms that the influence of parental monitoring on drinking and driving/riding behaviors can extend beyond the immediate driving context into young adulthood.

This study also confirms previous findings that alcohol use is a strong predictor of future DD and RDD (Bingham, Shope, & Raghunathan, 2006; Li et al., 2014; Maldonado-Molina, Reingle, Delcher, & Branchini, 2011; Vassalloa et al., 2008). This finding is of concern because alcohol use was prevalent: at wave 4, 45 % of study participants had consumed alcohol during the past 30 days, although virtually none of them was old enough to legally purchase alcohol. Although teen alcohol consumption nationally has declined since the mid-2000s when this study was conducted, prevalence remains high with estimates similar to what we found (CDC, ND), and many teens who drink do so to the point of intoxication (CDC, 2014b), putting them at increased risk of injury or other serious negative health outcomes.

In the final models, the presence of positive peer role models significantly reduced the likelihood of future RDD, but not DD. Why peer role models would be more protective for

RDD than for DD is unclear, but several possible explanations warrant mentioning. In a separate analysis of the Youth Assets Study (Oman, Tolma, Vesely, & Aspy, 2013), peer role models and parental monitoring were associated with reduced future alcohol consumption. In this study, we controlled for alcohol use and parental monitoring. If the pathway by which peer role models influence future DD is through reduced alcohol consumption, by controlling for alcohol use and parental monitoring we might have attenuated the effect of peer role models on future DD. Second, parents might be more vigilant about monitoring their teens' driving behaviors than riding behaviors. If so, when peer role models and parental monitoring are included simultaneously in the DD model, the parental monitoring asset may attenuate the effect of the peer role model asset. We conducted post hoc analyses to examine these hypotheses. Specifically, we investigated the predictive effect of peer role models on DD/RDD alone (see Table 3), with alcohol use controlled, with parental monitoring controlled, and with both alcohol use and parental monitoring controlled. We found that the effect of peer role models on DD was largely mediated through prior alcohol use and parental monitoring. In comparison, for RDD, alcohol use and parental monitoring had less of a mediating role. It is plausible that parents step up their monitoring of teens whom they know have a history of alcohol use, and parents have greater monitoring control over DD than RDD (e.g., direct control over vehicle access); thus, the influence of peers on DD is significantly decreased, yet remains significant for RDD. Lastly, differences in the social contexts in which the two behaviors take place might account for peer role models being more protective for RDD over DD. Compared to the DD context, in the RDD context where multiple youth are likely to be present, there may be a greater opportunity for social learning, disapproval, and reinforcement from positive peers. Perhaps supporting this notion, Elder et al. (2005) found that school-based interventions embedded in a peer context led to reductions in RDD, but not DD.

Little variability in two individual assets, namely general aspirations for the future and responsible choices, might explain the lack of measured influence on DD and RDD. Contrary to previous studies (Catalano et al., 2002; Oman et al., 2013), school connectedness was also not independently predictive. If the pathway by which school connectedness reduces future DD and RDD is through reduced alcohol consumption, by controlling for alcohol use we might have attenuated the effect of school connectedness on both outcomes.

While other studies have investigated the influence of specific assets on DD and RDD, we believe that our study is the first investigation of the predictive influence of a combination of individual, family, peer, and community assets on both DD and RDD. Although our study significantly contributes to the literature, it does have some limitations. The study design is longitudinal, which provides predictive value relative to cross-sectional designs; nonetheless the study is observational and correlational and therefore the relationships detected may not be causal. Other variables not measured and controlled for in statistical models (e.g., parental, family, peer, or community characteristics) could be responsible for the findings. Assets and behaviors based on self-report may have been underestimated or overestimated. However, these limitations would not be expected to affect the associations between the predictor and outcome variables. The RDD question did not distinguish whether the drinking driver was a peer or an adult, or whether the respondent had been drinking at the time of the

RDD episode. We analyzed data from waves of the study in which youth were of eligible driving age; however, data were not available on youth licensure, and determination of driving was based on self-report. The asset measures were dichotomized for analysis to assist in interpretation and because the responses were not normally distributed (with a positive skew) which might have resulted in loss of information and predictive power. Finally, data were not collected on crash or injury; it is unclear how the behavioral findings reported translate into injury outcomes.

Study findings suggest that interventions focused on parental monitoring have the potential to influence factors that place youth at risk for injury from drinking and driving and riding with a drinking driver. Such interventions extend beyond the proximal driving context to more general youth supervision. This finding is consistent with other research showing that social-emotional skills interventions with strong parent supervision components can reduce likelihood of DD and RDD, such as the Safe Drivers Wanted/Raising Healthy Children program (Haggerty et al., 2006); this program has been found to increase monitoring and supervision through family rules and written contracts, as well as reducing driving under the influence. These interventions complement other evidence-based strategies that reduce alcohol use (e.g., family-based interventions; Smit, Verdurmen, Mon- shouwer, & Smit, 2008; including those that have been found to enhance parental monitoring and supervision such as the Iowa Strengthening Families Program; Kumpfer, Whiteside, Greene, & Allen, 2010). Such interventions also complement evidence-based strategies that reduce RDD (e.g., school-based instructional programs; Elder et al., 2005), and alcohol-related motor vehicle crashes among teens (e.g., minimum legal drinking age of 21; ‘‘zero tolerance’’ BAC laws for young and inexperienced drivers; Shults et al., 2001). Interventions that support parental involvement more generally in their teen’s lives complement effective policies that directly enhance parental supervision in the proximal driving context, such as graduated driver licensing systems (McCartt, Teoh, Fields, Braitman, & Hellinga, 2010) and programs that incorporate Parent-Teen Driving Agreements (Simons-Morton, Hartos, Leaf, & Preusser, 2006).

Acknowledgments

Funding: Funding support for the Youth Assets Study was provided to the University of Oklahoma Health Sciences Center by the Centers for Disease Control and Prevention (CDC; Cooperative Agreement # 5 U01 DP0001320) and the Inasmuch Foundation; additional funding was provided to Oman and Vesely for supplemental analysis to support this manuscript.

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Table 1

Demographics of youth reporting riding with a drinking driver or drinking and driving

	Youth in riding with drinking driver analysis (*n* = 1053)	**Youth in drinking and driving analysis (*n* = 904)**
Age in years, mean (standard deviation); wave 4	17.30 (1.62)	17.55 (1.54)
Females (%)	53 %	52 %
Race/ethnicity		
Non-Hispanic White	40 %	41 %
Hispanic	28 %	28 %
Non-Hispanic Black	24 %	24 %
Non-Hispanic other	9 %	8 %
Family structure		
Two parent	58 %	58 %
One parent	22 %	22 %
Inconsistent	21 %	20 %
Parental education		
Both reported \HS	15 %	15 %
1 had HS, GED, or some college	55 %	54 %
1 had at least bachelor's degree	30 %	31 %

Table 2

Proportion of youth reporting assets and alcohol use in waves 3 and 4 and proportion of youth reporting outcomes of drinking and driving and riding with a drinking driver in waves 4 and 5

Variables	**Wave**					
	3		**4**		**5**	
	n	**%**	***n***	**%**	***n***	**%**
Assets (% with asset)						
Individual						
General aspirations for the future	959/1030	93	959/1020	94		-
Responsible choices	903/1030	88	907/1020	89		-
Relationship						
Family communication	597/1030	58	660/1019	65	-	-
Parental monitoring[a]	800/1030	78	700/1020	68	-	-
Positive peer role models	575/1029	56	560/1020	55	-	-
Community						
School connectedness	752/1030	73	736/1020	72	-	-
Risk behavior						
Alcohol use in past 30 days (yes)	369/1025	36	453/1012	45	-	-
Outcomes						
Riding with drinking driver	-	-	264/1030	26	272/1020	27
Drinking and driving	-	-	126/885	14	152/874	17

[a]This asset was not applicable (NA) to youth living independently; for wave 3, 175 youth reported not having the asset and the asset was NA for 55 youth; for wave 4, 199 youth reported not having the asset and the asset was NA for 121 youth

Table 3

Predictive effects of youth assets and alcohol use on drinking and driving

Initial models[a]	**Adjusted**[a]	
Parameter	**Odds ratio (95 % CI)**	***p***
Assets		
General aspirations for the future	1.16 (0.61, 2.22)	0.6492
Responsible choices	0.83 (0.55, 1.27)	0.4022
Family communication	0.61 (0.46, 0.81)	0.0007
Parental monitoring[b]	0.43 (0.31, 0.59)	<.0001
Peer role models	0.60 (0.45, 0.78)	0.0002
School connectedness	0.66 (0.49, 0.88)	0.0049
Risk behavior		
Alcohol use	4.62 (3.37, 6.32)	<.0001
Final model[c]	Adjusted[c]	
Parameter	Odds ratio (95 % CI)	*p*
Parental monitoring[b]	0.58 (0.42, 0.81)	0.0016
Alcohol use	4.18 (3.03, 5.78)	<.0001

[a]Seven separate initial models were analyzed (one for each asset and risk behavior). Each was adjusted for the potential confounders youth age group, gender, race/ethnicity, parent education, and family structure. Odds ratios for the potential confounding variables are not shown.

[b]Parental monitoring has three levels [yes, no, not applicable (NA)]; NA versus no was not statistically significant and not shown.

[c]The final model adjusted for the potential confounders above and also adjusted for other variables of interest in the final model. Only variables of interest with a *p* value B.05 were retained in the final model. Odds ratios for the potential confounding variables are not shown.

Table 4

Predictive effects of youth assets and alcohol use on riding with a drinking driver

Initial models[a]	**Adjusted**[a]	
Parameter	**Odds ratio (95 % CI)**	***p***
Assets		
General aspirations for the future	0.75 (0.50, 1.12)	0.1611
Responsible choices	0.65 (0.48, 0.88)	0.0058
Family communication	0.76 (0.61, 0.95)	0.0150
Parental monitoring[b]	0.67 (0.51, 0.89)	0.0050
Peer role models	0.54 (0.44, 0.67)	<.0001
School connectedness	0.62 (0.49, 0.78)	<.0001
Risk behavior		
Alcohol use	3.75 (2.99, 4.71)	<.0001
Final model[c]	Adjusted[c]	
Parameter	Odds ratio (95 % CI)	*p*
Parental monitoring[b]	0.75 (0.56, 1.00)	0.0462
Peer role models	0.68 (0.54, 0.85)	0.0009
Alcohol use	3.38 (2.68, 4.26)	<.0001

[a] Seven separate initial models were analyzed (one for each asset and risk behavior). Each was adjusted for the potential confounders youth age group, gender, race/ethnicity, parent education, and family structure. Odds ratios for the potential confounding variables are not shown

[b] Parental monitoring has three levels [yes, no, not applicable (NA)]; NA versus no was not statistically significant and not shown

[c] The final model adjusted for the potential confounders above and also adjusted for other variables of interest in the final model. Only variables of interest with a *p* value B.05 were retained in the final model. Odds ratios for the potential confounding variables are not shown