# Relative importance of caregiver characteristics for future alcohol consumption in youth involved with child welfare system

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## ABSTRACT

*Background:* Adolescents involved with child welfare system are disproportionately at risk for underage drinking. Little empirical evidence has informed interventions targeting child welfare caregivers to prevent alcohol consumption among adolescents involved with the system.
*Methods:* The present study addressed this gap by examining modifiable caregiver characteristics most predictive of future underage drinking in a cohort of adolescents (N = 1205) in a nationally representative child welfare dataset. We used dominance analyses to examine direct contributions of each caregiver predictor to the overall variance of future alcohol use. This is the first study to apply the reputable Turrisi and Jaccard (2001) framework of familial processes affecting underage drinking to the child welfare population.
*Results:* Findings highlight the role of caregiver-adolescent relational quality and communications for predicting underage alcohol use, and downplay the role of caregiver monitoring.
*Conclusions:* Child welfare service systems may help prevent underage drinking by systematically training and motivating caregivers to foster trusting, helping relationships and regular communications with the adolescents in their care.

## 1. Background

Underage drinking remains a reticent public health problem (Johnston et al., 2018). The burden of underage drinking is disproportionately distributed across U.S. subpopulations of various ethno-cultural background and socioeconomic status (Guilamo-Ramos et al., 2004). For example, youth residing in economically disadvantaged communities are at higher risk for substance use including underage drinking (Reboussin et al., 2010). Adolescents who are child welfare-involved are disproportionately at risk of developing substance use including alcohol use (Fettes et al., 2013; Gabrielli et al., 2016; Liu et al., 2018). In fact, substance use prevalence has been found to be significantly higher among child welfare–involved youth than community youth (Fettes et al., 2013; Aarons et al., 2010; Vaughn et al., 2006). More specifically, in a sample of 320 15–18 year-old youth residing in foster care in a Midwestern metropolitan area, 40% reported alcohol use, 36% reported marijuana use, and 25% reported both alcohol and marijuana use (Thompson and Auslander, 2007). Rates of substance abuse also tend to be high in child welfare involved parents; there is a well-established connection in the literature between substance use and child maltreatment (Magura and Laudet, 1996; Smith

et al., 2007; Brook and McDonald, 2009; Walsh et al., 2003) Widom and Hiller-Sturmhöfel (2001) specifically found that parental alcohol abuse may increase rates of child sexual abuse.

Children and adolescents who come under the radar of the child welfare system frequently experience problems in the familial social context prior to their entrance into the system (by way of parental maltreatment and interpersonal violence; U.S. Department of Health and Human Services et al., 2018) and after their entrance into the system (by way of broken or suspended caregiver attachments and turbulent placements; Rubin et al., 2007; James, 2004; Haight et al., 2003). In light of the fact that the achievement of timely permanency has emerged as a priority in the field of child welfare, child welfare agencies across the United States aspire to provide consistent guidance, support and training to caregivers, including the parents and family members of origin and the out-of-home caregivers of child welfare involved youth. Should these caregivers be offered ongoing support and information, families may be able to achieve more efficient permanency (Katz et al., 2018) and youth may be protected from a variety of problematic proximal and distal outcomes (McWey et al., 2010; Spielfogel et al., 2011). Little research has examined which malleable caregiver characteristics should be targeted in order to prevent development of

alcohol use by adolescents involved with child welfare system.

The present study seeks to identify modifiable caregiver characteristics that would most strongly predict future underage drinking among adolescents involved with Child Welfare system. The ultimate goal is to clarify which caregiver characteristics should be primarily targeted by child welfare agencies in order to prevent underage drinking. To answer this question we analyzed the data from the National Survey of Child and Adolescent Well-Being II (NSCAW), which uses a representative sample of children and adolescents with a child maltreatment report, and compared the importance of several key mutable caregiver characteristics for predicting the magnitude of the three-year increase in alcohol consumption among adolescents involved with the child welfare system.

## 2. Theoretical Framework

The current study uses a theoretical framework of parental effects on underage drinking put forth by Turrisi et al. (2001) and augmented by multiple subsequent studies (e.g., Guilamo-Ramos et al., 2004; Wetherill and Fromme, 2007). According to Turrisi et al. (2001), key familial processes affecting underage drinking include: (1) parent-adolescent communications about alcohol use and activities conducive to drinking, (2) parental monitoring of adolescent alcohol-related behaviors, (3) parent-adolescent relational quality, and (4) parents' own alcohol consumption. To our knowledge, no research to date longitudinally examined underage drinking among adolescents involved with child welfare system using Turrisi et al. (2001) model in its full form. The present study does that.

### 2.1. Parent-adolescent relationships and underage drinking in community samples

In accordance with the Turrisi et al. (2001) framework, research consistently finds that the extent of parent-adolescent communication on the topic of alcohol is inversely associated with adolescent alcohol consumption. Studies suggest stronger effects for behavior-specific than for global/generic communication constructs (Guilamo-Ramos et al., 2010; Perrino et al., 2000; Turrisi et al., 2001). Thus specific types of alcohol-related information communicated from parents to adolescents shown to predict underage drinking, include (a) parental acceptability beliefs/expectations about drinking and drinking-related activities such as leaving home without parental consent (Lushin, 2017), (b) warning messages (Schinke et al., 2009), and (c) parental discipline strategies/policies in regards to alcohol (Koutakis et al., 2008).The NSCAW dataset does not include items reflecting alcohol-focused communications between adolescents and their caregivers. Accordingly, the present research utilized generic communicative variables, including communications around adolescents' school experiences, home and social activities. Multiple studies show that, more generally, the amount of parent-adolescent communication on a variety of topics is related to less underage drinking (Abar et al., 2009); although the strength of the preventive effect is usually weaker for measures of overall communications compared with the measures of alcohol-themed communications (Abar et al., 2009).

The following dimensions of parent-adolescent relational quality have been demonstrated as predictors of undergo drinking: (a) helpfulness of the parents (as reported by child), (b) a trustworthy, open relationship between parent and adolescent, and (c) the adolescent's perception of the parent's warmth and emotional support (Lushin et al., 2017; Ryan et al., 2010).

Parental monitoring as a construct has been re-operationalized in the past decades. Instead of the focus on parental practices of "retrieving" information about kids' behavior ("monitoring", per se) the emphasis of this approach is on "monitoring knowledge," correct and consistent information passed on from adolescents to parents based on relationships of trust and openness (Lushin et al., 2017). Generally, less

underage drinking has been shown to be predicted by more knowledge parents have about their adolescent children's (a) activities, (b) whereabouts, and (c) companions (Arria et al., 2008; Beck et al., 2004; Koutakis et al., 2008).

Studies have demonstrated the effect of parental alcohol use for their adolescent offspring's patterns of drinking, particularly for the transition from experimenting with alcohol to hazardous use (Lieb et al., 2002). Research demonstrates that children of parents who drink more alcohol tend to have lower beliefs about the harm of alcohol use (Hawkins et al., 1997). Additionally, parental alcohol use is thought to be associated with having alcohol-specific rules about adolescent alcohol-related behavior, and to adolescents' motivation to adhere to these rules (Van Der Vorst et al., 2006). No studies have examined the role of caregiver alcohol use for underage drinking among adolescents involved with child welfare services.

### 2.2. Hypotheses and research goal

The abovementioned studies evaluated parent-adolescent relationships in community contexts. Evaluating these relationships in a sample of child welfare involved families, where rates of substance use in both parents and children is particularly high, may yield different results. In accordance with the Turrisi et al. (2001) model, we hypothesize that underage drinking among adolescents involved with child welfare system is predicted by (1) the quality of adolescents' relationships with their caregivers, (2) an extent of adolescents' communication with their caregivers, (3) the extent of caregivers' monitoring knowledge about adolescents' activities and companions, and (4) caregivers' own alcohol use. We used an innovative method of relative importance analysis, dominance indices, also referred to dominance analysis (Azen and Budescu, 2003), to accurately compare the contributions of the above caregiver factors for the 3-year development of adolescent alcohol use. The paper identifies potential targets for child welfare administrators to focus on in providing guidance and training to the caregivers aimed to prevent and minimize underage drinking among adolescents involved with the child welfare system.

## 3. Methods

### 3.1. Dataset

The NSCAW-II is a longitudinal dataset containing information on a nationally representative sample of 5872 youth, ages 0–18 (Wave 1: 2008–2009; Wave 3: 36 months later) who have undergone a formal Child Protective Services investigation stemming from a child abuse or neglect report (either substantiated or unsubstantiated). Sponsored by the Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, the NSCAW-II (2014) includes data on the functioning, service needs, and service use of children who have come in contact with the child welfare system (Casanueva et al., 2011). Information is available on the child's health, mental health, social functioning, academic achievement, development, and family, and on the investigation of abuse or neglect. Children were sampled from child welfare investigations closed between February 2008 and April 2009 in 83 counties across the United States. Data were collected from 5872 children, their parents, non-parent adult caregivers (e.g., foster parents), and caseworkers. For our purposes, Wave 1 and Wave 3 were used. Within the full sample of NSCAW participants of all ages, we focused on the sample of adolescents aged 11 years and older (N = 1205), because data on alcohol consumption were collected only for this age sample. Among our sample, 49% were Female, 85% were White, 23% were Latino/a, and the average age at Wave 1 was 14.5 (SD = 3.73). Among primary caregivers, 57.5% were biological mothers, 7.6% were grandmothers, 6.5% were biological fathers, 4.3% were aunts, 1.7% were adoptive mothers, 1.2% were step-mothers, and 3.6% were other relatives;

13.0% were foster parents, and 4.6% were other non-relatives. Overall. 82.4% of caregivers were relatives. We obtained IRB approval for the use of the secondary data.

### 3.2. Measures

*Adolescent Alcohol Consumption Frequency* for Waves 1 and 3 was measured by the following questions: "In the past 30 days, how many days have you had at least 1 drink of alcohol" and "During life, how many days have you had at least 1 drink of alcohol?" Responses were on the seven-point scale, from "no days" to "all 30 days" (for the former item) and from "never" to "100 or more days" (for the latter item). Alcohol use data were collected only in the sample of adolescents aged 11 and older (N = 1205). At Wave 1, 30% of the sample had reported some lifetime alcohol use. At Wave 3, a half of the sample had reported some alcohol use. This suggests that, for about 20% of the sample, the outcome variable represents new initiation of alcohol use, and for about 30% of the sample, it represents ongoing alcohol use.

*Caregiver-adolescent communications* items were taken from two NSCAW inventories. One is the Closeness with Caregiver inventory adapted from the National Longitudinal Study of Adolescent Health (Add Health), In-Home questionnaire, published first by the Carolina Population Center at the University of North Carolina at Chapel Hill (Chantala and Tabor, 1999). We used all the Inventory's four questions pertaining to communication; questions were dichotomous (yes/no); examples are, *"Has your caregiver talked with you about your problems during the past 4 weeks?"* and *"Has your caregiver talked with you about school during the past 4 weeks?"* Cronbach's alpha for the Closeness scale in NSCAW was 0.6. Another source of communication questions in NSCAW is the Parental Monitoring Supervision Child Scale from Fast Track Project (Harnish et al., 1995). Adolescents were asked to respond to frequency of communication questions on a five-point scale (from "almost never" to "almost always"); examples included, *"How often does your caregiver talk with about your plans for coming day?"* We used all the Scale's three questions pertaining to communication. The Cronbach's Alpha of the composite of the resulting ten communication questions was 0.73.

*Relational Quality* questions were taken from Rochester Assessment Package for Schools (Connell et al., 1995; Lynch and Cicchetti, 1991). Adolescents responded to statements on a four-point agree/disagree scale; example items included, *"My caregiver does a lot to help me."* We used all the 14 items of the scale; appropriate items were reverse-scored. The Cronbach's Alpha of the scale was 0.87.

*Parental Monitoring* was measured by the Parental Monitoring Supervision-Child Scale from Fast Track Project (Harnish et al., 1995). Items were dichotomous (yes/no); example items included," *Are you allowed to leave house when caregiver is not at home?"* Following recommendations by Guilamo-Ramos et al. (2010), we used seven questions pertaining to parental monitoring knowledge and monitoring rules, but not parent-adolescent communication. Cronbach's alpha was 0.72.

*Caregiver Alcohol Use* was measured by Alcohol Use Disorders Identification Test (AUDIT: Babor et al., 2001). Some items were answered on a five-point frequency scale (0 = never; 4 = every day); example items included, "*How often do you have a drink containing alcohol?*" Other items were dichotomous (yes/no); examples included, *"In the past six months, were you hospitalized for alcohol-related conditions?"* Cronbach's alpha was 0.7.

### 3.3. Analytic strategy

#### 3.3.1. Missing data

We first explored missing data bias, the presence of systematic differences between youth who were missing data compared with those with complete data. For that end we computed dummy variables reflecting the presence or absence of missing data for each variable in the
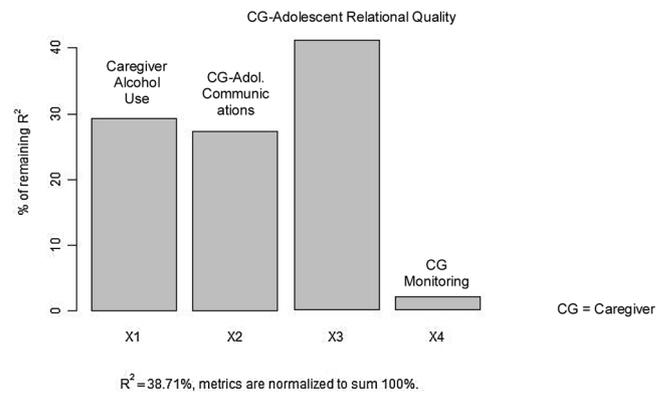


**Fig. 1.** Relative Importance of Theoretically Grounded Caregiver Characteristics for Underage Drinking among Adolescents Involved with Child Welfare System. *Classes of caregiver predictors are composited.*

model and then correlated these dummy variable with all other variables in the model as well as an array of demographic variables with complete data such as adolescent gender and age (see Results / Preliminary Analysis). We then performed Markov-chain Monte-Carlo multiple imputation (Schunk, 2008) to handle missing data. The main data analytic procedures were performed using the imputed data set of the full sample of 1205 adolescents aged 11 and older.

*Descriptive statistics* for the sample characteristics were derived. Means and standard deviations were computed for continuous variables, and frequencies, for dichotomous variables. Drinking frequency variables, and composites of parent-adolescent communication, relational quality and monitoring, were tested for gender differences.

#### 3.3.2. Main analyses

To test the hypotheses guided by the Turrisi and Jaccard model (Fig. 1) we analyzed the relative importance of the caregiver predictors of underage drinking guided by the Turrisi and Jaccard model, namely caregiver-adolescent communication and relational quality, caregiver monitoring, and caregivers' own alcohol use. We used dominance analysis (Budescu and Azen, 2004) to compare each predictor's unique contributions to the explained variance of the outcome, free of collinearity. The predictors with the largest relative importance/dominance indices make the greatest contribution to the outcome and provide the most important preventive intervention targets, relative to other predictors in this model. The importance metrics are scaled from 0 to 100 and sum to 100 across predictors. They indicate the relative contribution to the overall squared correlation of future drinking. We first analyzed relative importance for the future drinking of the composite variables reflecting the above caregiver predictors described in Measures section: quality of relationship with caregivers, communication with caregiver, caregiver monitoring and caregiver alcohol use. We then disaggregated those composites which demonstrated highest predictive importance by deriving dominance indices of the individual items of which these "champion" composites are comprised. The goal of this disaggregation was to identify specific, malleable caregiver characteristics indicating the strongest intervention targets to prevent increase of alcohol use among adolescents involved with the child welfare system.

*Covariates* included child and caregiver demographic variables (such as age, gender and race), as well as baseline levels of adolescent alcohol use, depression, trauma, and level of harm prior to foster care entry, and caregiving families' socio-economic status, as reported in Table 1. Some covariates specific to the child welfare population, such as youth's foster family status, are further discussed in Descriptive Statistics.

**Table 1**
Descriptive Statistics.

| | Mean (SD) | Percent |
|---|---|---|
| Child Age at W1 | 14.5 (3.73) | – |
| Child Gender Female | – | 49 |
| Child Race White | – | 85 |
| Child Race Black | – | 10 |
| Child Race Other | – | 6 |
| Child Latinx | – | 23 |
| Child Depression Raw Score (range: 0-45) | 9.64 (7.86) | – |
| Child Trauma Raw Score (range: 0-30) | 8.78 (6.08) | – |
| Level of Harm (range:1-4) | 2.33 (1.07) | – |
| Caregiver is a foster parent | – | 13 |
| Caregiver Age at W1 | 35.55 (13.47) | – |
| Caregiver Gender Female | – | 92 |
| Caregiver's Educational Attainment: Below High School | – | 24 |
| Caregiver's Educational Attainment: High School | – | 43 |
| Caregiver's Educational Attainment: Over High School | – | 33 |
| Caregiver Race White | – | 57 |
| Caregiver Latino | – | 22 |
| Caregiver Income < 50% of Federal Poverty Level | – | 22 |
| Caregiver Income 50-100% of Federal Poverty Level | – | 27 |
| Caregiver Income 101-200% of Federal Poverty Level | – | 26 |
| Caregiver Income > 200% of Federal Poverty Level | – | 24 |
| Caregiver Works Full Time | – | 32 |
| Caregiver Works Part Time | – | 16 |
| Caregiver Unemployed / Not Working | – | 52 |
| Caregiver is a biological parent | – | 64 |
| Caregiver is a biological mother | – | 57.5 |
| Caregiver is a biological father | – | 6.5 |
| Caregiver is a biological grandparent | – | 7.6 |
| Caregiver is another relative | – | 10.8 |
| Caregiver is a foster parent | – | 13 |
| Caregiver is a another non-relative | – | 4.6 |

**Table 2**
Variables of Theoretical Interest.

| | Mean (SD) | Percent |
|---|---|---|
| Past 30 days drinking scale, Wave 1 (range 0-6) | 0.78 (1.04) | – |
| Past 30 days drinking scale, Wave 3 (range 0-6) | 0.94 (1.22) | – |
| Lifetime drinking scale, Wave 1 (range 0-6) | 0.94 (1.50) | – |
| Lifetime drinking scale, Wave 3 (range 0-6) | 1.02 (1.60) | – |
| Monitoring Mean Score (range 1-5) | 4.15 (.84) | – |
| Relational Quality Mean Score (range 1-5) | 3.73 (.68) | – |
| Communication Mean Score (range 0-5) | 2.36 (0.88) | – |
| Caregiver Alcohol Use Index (range 0-2) | 0.20 (0.27) | – |
| Caregiver Trusts Adolescent (range 1-5) | 3.30 (0.93) | – |
| Caregiver Helps Adolescent (range 1-5) | 3.62 (0.78) | – |
| Caregiver has talked with adolescent about dating in the past 4 weeks | – | 52% |
| Caregiver has talked with adolescent about school in the past 4 weeks | – | 78% |

## 4. Results

### 4.1. Preliminary analyses

#### 4.1.1. Missing data

The adolescent alcohol use frequency composite, the key outcome variable, missed 7.6% of data. Relational Quality and Communications variables missed 18% and 20% of data, respectively. No statistically significant correlations were identified between the patterns of missing data and variables unaffected by missing data, including adolescents gender and age. Parental alcohol use composite score was unaffected by missing data. Some of the covariates, including child depression, trauma, and level of harm, missed up to 20% per cent of data; according to our analyses, the data were missing at random. Markov-chain Monte-Carlo multiple imputation was performed to handle missing data with five iterations, as recommended by Schunk (2008). To verify the accuracy of the multiple imputation, we performed multiple regression analysis with all the variables involved, first in an imputed data set, using R, and then in a non-imputed data set using Mplus with full information maximum likelihood algorithm for handling missing data (Asparouhov and Muthén, 2010). Regression coefficients were consistent across the two analyses, indicating good accuracy of multiple imputation.

### 4.2. Descriptive statistics

#### 4.2.1. Descriptive

Tables 1 and 2 display the sample characteristics including socio-demographics (Table 1) and variables of theoretical interest (Table 2). Statistics are reported for the full gender sample of adolescents because preliminary analyses did not reveal gender differences in key parameters including frequency of drinking and composites of parent-adolescent communication, relational quality and monitoring. The

composite score of Wave 3 adolescent alcohol use (alpha = 0.71) had the sample mean 0.96 (SD = 1.60; range = 0–6), an overall increase from the Wave 1composite mean drinking score, 0.82 (SD = 0.8). Thirteen percent of adolescents were in foster families; the remaining youth were living with relatives and 92% of the latter lived with at least one biological parent. Adolescents' foster family status was used as a covariate in all computations.

#### 4.2.2. Normality

Analysis of skewness was performed for the variables involved. Adolescent past 30 days frequency of drinking and lifetime frequency of drinking variables were moderately positively skewed (between 1 and 1.6) and moderately leptokurtic. The reliability of our results was not compromised because dominance analysis, unlike multiple regression analysis, does not rely on normality assumptions (Azen and Budescu, 2003).

#### 4.2.3. Psychometric properties of multi-item scales

The measures of relational quality, communication, monitoring and caregiver alcohol use are multi-item, reflexive scales with 4, 5, 8 and 6 items, respectively. Items were averaged for each construct to examine the overall effects of Turrisi and Jaccard model constructs. By averaging items, an assumption is made that a single factor/latent variable dominates the correlational structure of items. This should translate into large composite reliability indices for each scale (Raykov, 1997). First, one-factor models for the relational quality, communication, monitoring and caregiver alcohol use, were fit to the data using a confirmatory factor analysis (CFA). All models yielded good model fit (RMSEA < 0.08; p-value for the test of close fit (pclose) > 0.01; CFI > 0.95; standardized root mean residual (SRMR) < 0.05), which is consistent with prior studies of the above instruments (see Measures). The composite reliability indices for the above measures (Raykov, 1997) were > 0.7, which supports the use of single, global indices for each measure.

### 4.3. Relative importance analysis

#### 4.3.1. Relative importance of theoretically grounded predictors

Table 3 and Fig. 1 present the relative importance analysis of each baseline caregiver variable in predicting future alcohol use among adolescents, in the imputed sample of 1205 adolescents. In the four-predictor model guided by the Turrisi and Jaccard framework, the overall variance of EBA intentions explained by all four caregiver predictors together was 38.71%. The largest portion of explained variance of future drinking was accounted for by Caregiver-Youth Relational Quality (importance = 41.19%). Caregiver-Youth Communications accounted for 27.35% of the outcome variance, and caregivers' own alcohol use, and accounted for 29.35% of the outcome variance. In

**Table 3**

Relative Importance of Caregiver Characteristics for Predicting Underage Drinking.

| | Proportions of Explained Variance in Future Drinking (Percent) |
|---|---|
| | Importance of Composite Predictor Variables |
| Caregiver-Youth Relational Quality | 41.19 |
| Caregiver-Youth Communications | 27.35 |
| Caregivers' Own Alcohol Use | 29.35 |
| Caregiver Monitoring | 2.11 |
| $R^2$ (Cumulative Explained Variance) | 38.71 |
| | Importance of Disaggregated Items |
| Caregiver Trusts Adolescent | 18.02 |
| Caregiver Helps Adolescent a Lot | 38.76 |
| Caregiver and Adolescent Talked about Dating | 38.11 |
| Caregiver and Adolescent Talked about School | 1.3 |
| Lack of Supervision | 2.78 |
| $R^2$ (Cumulative Explained Variance) | 39.44 |

contrast, the composite of caregiver monitoring knowledge accounted only for a small fraction of the explained variance (Importance = 2.11%).

*4.3.2. Disaggregating relative importance of scale items*

We disaggregated the relative importance of individual items of the two caregiver constructs most predictive of underage drinking, caregiver-adolescent communication and caregiver-adolescent relational quality (Fig. 2 ) Table 3). Items accounting for one percent or more of outcome variance each were included (Middlestadt et al., 1996). The single most predictive item was the adolescents' account of the caregiver's helpfulness in the adolescent's life, which accounted for 38.76% of the explained variance in future drinking. It was followed by the youth's response about communications with caregivers about dating; this item accounted for 38.11% of the explained variance. Adolescent's response about being trusted by the caregiver accounted for 18.02% of the explained variance. Adolescent responses about the lack of supervision accounted for 2.78% of outcome variance, and communications about school, for 1.3% of the explained variance. (Fig. 2; Table 3).

## 5. Discussion

The study provided several theoretically interesting findings that highlight potential targets for underage-drinking prevention in the context of the child welfare system. First, our data demonstrated an overall strong caregiver impact on the future alcohol use among adolescents involved with the child welfare system, with the four classes of



**Fig. 2.** Relative Importance of disaggregated *Caregiver Communication and Adolescent-Caregiver Relational Quality items.*

caregiver determinants based on the Turrisi et al. (2001) model explaining up to 42% of future drinking variance. Apparently, for child welfare-involved youth, as for their mainstream peers, supportive and empowering caregiving plays a protective role in reference to health risk behaviors.

Our findings implicate the trustful, helping caregiver-adolescent relationships as the most important caregiver characteristic, by far, to deter future underage drinking. This superior protective role of the relational quality appears to distinguish adolescents involved with the child welfare system from the mainstream youth for whom protective effects of other parental determinants, such as communication, monitoring and parent drinking, tend to be commensurate with the effect of relational quality (Guilamo-Ramos et al., 2010). A possible interpretation may lie with the fact that child welfare system involvement typically follows child maltreatment and interpersonal violence in the child's family of origin. Adolescents with these lived experiences may become increasingly sensitized to the manifestations of poor relational quality with caregivers, and primed to anticipate resulting threat more vigilantly than mainstream youth (Loman and Gunnar, 2010; Sanchez et al., 2001). Therefore, youth with a history of maltreatment may be disproportionately stressed when perceiving relational problems with caregivers and may seek relief in peer activities involving alcohol use. Conversely, the experience of caregivers' trust and helpfulness, may equate with feeling safe and supported, and may play a protective role by strengthening youth's self-esteem, a known deterrent of underage drinking (Lushin et al., 2017).

In our data, items of caregiver trust and caregiver helpfulness dominate among all other factors protective against future underage drinking. A potential interpretation, in line with Keijsers and Laird (2010), and Lushin et al. (2017), as well as the body of work by Stattin et al. (2001), (2003), (2010), is that an adolescent's perception of the caregiver as trustful and helping rather than suspicious and controlling encourages adolescent's open and honest information management. Consequently, the adolescent openly discloses to caregivers, and does not conceal from them even the unpleasant information, including disclosures about alcohol use, and seeks caregiver's advice for difficult choices such as engagement in alcohol-related peer behaviors (Kerr and Stattin, 2003; Stattin et al., 2010). Studies show that adolescents' use of information disclosing strategies is more strongly linked to positive aspects of the parent-child relationship, such as trust and feeling helped, while the use of concealing strategies is more strongly linked to negative aspects of the relationship, such as perceptions of caregiver control (Keijsers and Laird, 2010; Smetana et al., 2006).

Further in support of this logic, our findings evidenced a limited protective role of caregiver monitoring as operationalized in the given dataset. Some monitoring questions in this study are worded in the way that emphasizes social control, power differentials, and reporting to the superior (e.g., "Are you allowed to leave house when caregiver is not at home?" or "How often your caregiver knows who you are with when away from home?"). Adolescents feeling controlled by caregivers may be more inclined to conceal troubling information from them, and thus lack the benefits of caregivers' advice and empowerment (Keijsers and Laird, 2010; Lushin et al., 2017; Stattin et al., 2010). This may potentially explain the limited protective utility of caregiver monitoring as operationalized by this study. A clear message to the developers of caregiver training programs within the child welfare system is that such programs should encourage, motivate and assist caregivers in building trustful, helpful relationships with adolescents in their care and thus ensure youth's voluntary disclosures, instead of prompting caregivers to monitor adolescents' lives by exercising excessive social control and assuming the role of "home police."

Generally, the present training programs provided by child welfare services for both parents and foster caregivers are composed of basic topics, including behavior management, attachment, loss and grief, involvement of both birth and foster families (Christian, 2002). While the use of competency-based training (e.g., relational skills, building
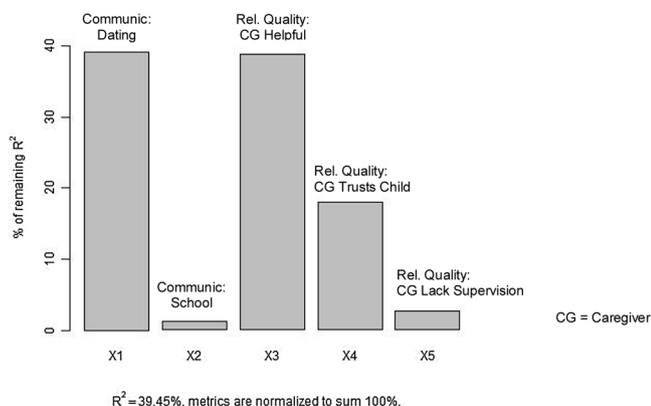
trusting relationships and environment) is recommended by Casey Family Programs and the U.S. National Foster Parent Association, not all states use such training models (Childrenös Bureau, U.S. et al., 2009; Buehler et al., 2006). Although there is a lack of research in the existing literature on the effects of foster parent training, findings from studies like ours reveal that there is a need for extensive training and further improvement.

Interestingly, among disaggregated communication items, the most predictive one reflected whether the caregiver had talked with the adolescent about dating. One potential interpretation may be that dating practices such as "going out" to entertainment venues or informal peer gatherings, present potential contexts for drinking (Kreager and Haynie, 2011). Additionally, both dating practices and alcohol use are associated with adolescents' self-esteem and ability to resist peer pressure (Guilamo-Ramos et al., 2011; Miller, Naimi et al., 2007). Youth with lower self-esteem may be more easily coerced by peers to engage in drinking, and/or in sexual risk behaviors while dating, as well as be victims of dating violence (Miller et al., 2007). Self-esteem and peer pressure resistance are strengthened by parental communication (Guilamo-Ramos et al., 2011). Therefore, discussions with caregivers that empower adolescents around dating may help them resist peer pressure in drinking contexts, as well. More studies should examine the nature and content of caregiver-adolescent communications; including those related to alcohol use and dating, and further analyze impacts of communication across subject areas on adolescent risk behaviors.

## 6. Limitations

One limitation of the study is the absence of alcohol-specific communication variables in the data source and, consequently, in our analyses. This may partially explain why the predictive utility of caregiver-adolescent communications in our analysis, while considerable, was noticeably weaker than that of relational quality. Future research with child welfare populations should further examine protective utility of alcohol-themed communications with caregivers. Also, most variables relied on self-reports. While NSCAW designers made viable effort to encourage honest reporting, self-reported data should be interpreted with caution. Another limitations pertain to the overly broad semantic reach of some of the questions. For example, caregiver-adolescent communication is measured by questions such as "Has your caregiver talked with you about school?" Such questions lack in precision, especially as yes/no questions. Additionally, potential for common method / shared variance biases is always a concern with large psychometric studies.

## 7. Implications for research and policy

Despite these limitations, our study suggests important implications for further research and alcohol prevention policy and practice. First, our findings suggest that child welfare service systems may contribute to preventing underage drinking among their adolescent clients by developing and implementing caregiver-targeting programs for parents who are participating in preventive programs, foster parents who are caring for adolescents in care and child welfare staff who work in group homes serving adolescents. Such programs could train and motivate caregivers to foster trusting, open relationships with the adolescents in their care. It may also be beneficial to train caregivers to communicate with adolescents about alcohol use along the lines of existing preventive communication programs for parents, such as "Families Talking Together" which effectively reduces youth sexual risk behavior (Guilamo-Ramos et al., 2011). The latter program, for example, trained parents to convincingly dismantle adolescents' most consequential sex-related beliefs (e.g. sexual intercourse makes one more popular). Most preventive programs focus mainly on health consequences of sex which are shown to be less important in predicting youth health risk behavior.

Similar programs targeting alcohol use may be feasibly developed, implemented and evaluated by child welfare service systems in partnership with academic centers and behavioral health providers.

Future studies should test developmental models examining underage drinking among adolescents involved with child welfare system as a function of malleable caregiver characteristics and actions. Such models may highlight (a) alcohol-specific communication and monitoring knowledge determinants, (b) mediation mechanisms explaining effects of such determinants by changes in adolescent psychological characteristics (e.g. self-esteem, self-efficacy in resisting peer pressure, etc.); and (c) moderation effects of relevant adolescent characteristics such as the age of the youth's exposure to the child welfare system, and others.

## Contributors

Author Lushin developed the initial idea of the article, contributed to data analysis, and writing the paper.

Author Katz contributed to further developing the concept of the article, data analysis, and writing the paper.

Author Lalayants contributed to further developing the concept of the article, data analysis, and writing the paper.

All authors have approved the final article.

## Declaration of Competing Interest

"No conflict declared" – Authors have no conflict of Interest.

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