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## Family Communication and Adolescent Alcohol Use in Nicaragua, Central America: A Test of Primary Socialization Theory

Jonathan Pettigrew , YoungJu Shin , James B. Stein , and Lisa J. Van Raalte 

Hugh Downs School of Human Communication, Arizona State University

### ABSTRACT

Applying primary socialization theory to a sample of early adolescents from Nicaragua, this study examines direct and indirect associations between family bonding and adolescent alcohol use via substance specific prevention communication (SSPC) and adolescent efficacy. Early adolescents in 7th and 8th grades completed a self-report, cross-sectional survey. Structural equation modeling revealed that family expressiveness was significantly indirectly related to adolescent lifetime alcohol use through SSPC. Results are discussed in relation to primary socialization theory, family communication, and international substance use prevention efforts. This study provides supportive evidence for the important role of positive family communication as a protective factor for early adolescents in Nicaragua.

Using licit and illicit drugs, often referred to as substances (e.g., alcohol, cigarettes, cocaine, prescription drugs), is a risky behavior that can lead to addiction and other health problems for adolescents around the world. Research has documented a number of short-term and long-term consequences associated with substance use in adolescents, such as poor cognitive and neurological development, health problems, addiction, crime, unemployment, and mood disorders (Boden & Fergusson, 2011; D'Amico, Ellickson, Collins, Martino, & Klein, 2005). Alcohol is one such substance and is the most commonly used substance among adolescents (National Institute on Drug Abuse, 2016). Alcohol use is an avoidable risk that has been associated with numerous public health problems (World Health Organization, 2005), and the global burden of deaths and disability-adjusted life-years attributable to alcohol use across the lifespan are 3.8% and 4.6%, respectively (Rehm et al., 2009). It is important to keep in mind that quantifications of burden typically do not factor in other issues such as violence related to substance dealing or theft (Degenhardt & Hall, 2012). In Central America, for example, Honduras has maintained one of the highest murder rates per capita in the world since 2010 with much of this violence attributable to narcotics trafficking (U. S. Department of State, 2015). The health consequences associated with substance use and violence surrounding global trafficking of substances make it an important risk to prevent.

Focusing on family communication processes is a promising direction for addressing adolescent substance use. Family interactions can substantially influence adolescent substance behavior (Becoña et al., 2012) and most adolescents report engaging in some kind of conversation with their parents about substances (Pettigrew, Shin, Miller-Day, & Hecht, 2013). Parents' rules, advice, and values regarding substance use can impact adolescent behaviors (Miller-Day, 2008; Reimuller, Hussong, & Ennett, 2011; Shin, Lee, Lu, & Hecht, 2016; van der Vorst, Engels, Meeus, Deković, & Van Leeuwe, 2005). Adolescent substance use typically co-occurs with other delinquencies—for example, anti-social behavior, academic failure, and risky sexual activity (Dishion & Patterson, 2006; Tapert, Aarons, Sedlar, & Brown, 2001)—which potentially multiplies the positive effects of identifying

ways family interaction relates to adolescent substance use. Also, considering that there is a general developmental trend toward increased substances use during adolescence (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2014), understanding how family interaction protects early adolescents against substances can have long-term benefits. This may be especially true in the Nicaraguan context.

### **Substance use in Nicaragua**

The most recent epidemiological data for Nicaragua, collected between 1999–2000, show that Nicaraguan adolescents (approximately 16 years old) have similar or slightly higher than average usage rates compared to six other countries in the region (Dormitzer et al., 2004). Estimated cumulative rates for alcohol and tobacco are 49% and 34%, respectively (Dormitzer et al., 2004). To contextualize these rates further, data from the 2013 national survey of U.S. adolescents show similar use for 10th grade students in the United States: 49% reported lifetime alcohol use and 23% reported lifetime cigarette use (Johnston et al., 2014).

Despite the similar overall usage rates, Nicaraguans face unique substance-related challenges. For example, as part of the land bridge between cocaine production in South America and its primary market in the United States, Nicaraguan adolescents are at especially high risk for substance use due to the trafficking of substances (Dudley, 2010). Another challenge is that broader social and legal sanctions against alcohol use are nonexistent or not strictly enforced (Pettigrew, Sohn, Dalton, Castillo, & Allsup, 2015). The legal age for purchasing alcohol in Nicaragua is 18 (Codigo de la Niñez y de la Adolescencia, 2015: cf. Law 287, articles 66, 67, and 68), but this is rarely enforced. Alcohol is relatively inexpensive and readily available.

Furthermore, alcohol is the most commonly used substance in Nicaragua, especially among adolescents and young adults (Dormitzer et al., 2004), which has led to numerous alcohol-related deaths. For example, a news report asserts that car accidents are the leading cause of death for Nicaraguan 20–35-year-olds, and in 2012 a police commander claimed that 33% of car accidents involve alcohol, either from the driver being inebriated or an inebriated pedestrian walking in front of a car (Zepeda, 2013). This claim accords with data presented by the Pan-American Health Organization's report that 20–50% of traffic accidents in the Americas involve alcohol (Monteiro, 2007). Taken together, the saliency of substance use in Nicaragua, especially alcohol, makes understanding the role that parents play in deterring adolescent substance use all the more valuable.

### **Primary socialization theory**

A tenured theory that helps explain how family communication processes influence adolescent substance use is primary socialization theory (PST: Oetting & Donnermeyer, 1998). PST highlights the processes through which adolescents learn and then enact social behaviors. Specifically, Oetting and Donnermeyer claim that the beliefs, values, attitudes, and eventual behaviors of adolescents are shaped through three primary social groups: family, school, and peers (Oetting & Donnermeyer, 1998). By interacting with these three groups, individuals form a set of beliefs, values, and attitudes that later influence the amount of delinquent or pro-social behaviors that are enacted during adolescence. According to PST, a lack of bonding with parents or the school likely leads to diminished self-control and eventual gravitation toward delinquent behaviors (Higgins, Ricketts, Marcum, & Mahoney, 2010). In other words, internalized dispositions and beliefs mediate the effects of primary socialization processes on behavioral outcomes (Gottfredson & Hirschi, 1990; Oetting & Donnermeyer, 1998).

Focusing on parents as socializing agents, primary socialization theory suggests that if parents and youth are bonded, youth are less likely to engage in self-destructive behaviors such as alcohol use. The current study explores these tenets of PST with data from a sample of early adolescents in Nicaragua, Central America. Specifically, we test a model that considers whether the relationship between parental bonding and adolescent alcohol use is mediated by internalized beliefs (i.e.,

decision-efficacy and refusal-efficacy) and substance specific prevention communication (SSPC). We focus on parents as socializing agents and reason that parental bonds are formed and modified through communication (Bochner, 1976).

### ***Bonding via communication***

With PST, Oetting and colleagues argue that parent-child bonding is related to youth behavioral outcomes (Oetting & Donnermeyer, 1998), so it is important to consider the nature of bonding and how bonding occurs. Previous research on parenting has consistently demonstrated that authoritative parents provide the most conducive environment for youth to flourish, compared to authoritarian and passive parents (Baumrind, 1971, 2013; Steinberg, 2001). An authoritative parent provides “an emotional climate of warmth and involvement intended to encourage a child’s independence and autonomous self-expression” (Baumrind, 2013, p. 17) and also engages in confrontive control (e.g., demanding, firm, and instructive) rather than coercive control (e.g., intrusive, manipulative, punitive and restrictive) (Baumrind, 2013). Thus, bonding to a parent is facilitated best when warmth is high and control is appropriate. It is reasonable to argue that parental bonding occurs as a result of generalized patterns of communication between parents and children.

Bonding through warm parent-child relationships is facilitated by an expressive family communication climate. For example, an observational study measured expressiveness (also termed conversation orientation, see Koerner & Fitzpatrick, 2002) by coding parent-child communication, listening, and warmth (Rueter & Koerner, 2008). Results indicated that expressiveness was protective against adolescent externalizing behaviors. Studies of college samples revealed that expressiveness was positively correlated with authoritativeness (Hamon & Schrodt, 2012), and higher levels of expressiveness were related to improved mental well-being (Schrodt, Ledbetter, & Ohrt, 2007), lower stress and mental health symptoms (Schrodt & Ledbetter, 2007), and better communication competence (Schrodt et al., 2009). More evidence was found that reports of parental expressiveness related to lower substance use in early adolescents (Miller-Day, Lee, & Pettigrew, 2012). This literature, on a whole, indicates a strong link between expressive family communication and youth mental and behavioral well-being. Thus, based on PST and previous literature, we postulate that expressiveness in families is positively related to bonding, which in turn, is related to lower rates of alcohol use.

Fully examining parental bonding requires consideration of both warmth and appropriate levels of control because warmth alone is not able to distinguish authoritative, authoritarian, and passive parenting (Baumrind, 2013). Parental control, however, is less consistently related to outcomes (for example, see meta-analysis of conformity orientation, Schrodt, Witt, & Messersmith, 2008) and harder to capture empirically. For example, one study of college students revealed that perceptions of control were negatively associated with authoritativeness (Hamon & Schrodt, 2012). Indeed, measuring parental control may not capture the nuance between a parent’s egocentric dictums and loving boundaries (Koerner & Schrodt, 2014). Rather than examine levels of control, another approach is to measure overprotection, or unwanted control (Parker, 1989). This approach brings restrictive parenting practices into focus.

More importantly, the present study focuses on warmth (i.e., expressiveness) and control (i.e., overprotection) simultaneously. A family environment does not function as discrete sets of variables related to adolescent risk behaviors. Rather, it is a dynamic, fluid, analog mixture of personalities, daily episodes, history, and interaction (Pettigrew, 2014). In terms of warmth and control, it is possible that one dimension may be more important than the other for predicting adolescent beliefs and, ultimately, risk behaviors such as alcohol use. Thus, both expressiveness and overprotection are considered as measures of parental bonding in this study. In addition, given that there is ample evidence suggesting the positive links between adolescent efficacy (e.g., Kadden & Litt, 2011) and parent-child communication about substance use (e.g., Kam & Middleton, 2013), the current study also examines the indirect relationships of parental bonding and early adolescent alcohol use via adolescent efficacy and SSPC.

## Adolescent efficacy

PST assumes that parental bonding shapes adolescent beliefs, and, in turn, these beliefs are proximate predictors of adolescent behaviors (Oetting & Donnermeyer, 1998). One particularly salient belief that may be shaped by parent-child bonding is self-efficacy. Social Cognitive Theory (SCT, Bandura, 1977) defines self-efficacy as one's level of confidence in his or her ability to perform a task required in accomplishing a goal. Self-efficacy was quickly recognized as a seminal concept and was integrated into extant and subsequent health-related theories (for review, see World Health Organization, 2012).

In tandem with PST, research has demonstrated a connection between parenting practices and adolescent self-efficacy. For example, consistent and appropriate parenting leads to greater adolescent self-efficacy, which results in better outcomes (Gottfredson & Hirschi, 1990). This has been studied in the context of parental abuse (Finkenauer et al., 2015), pro-health and wellness behaviors (Moffitt et al., 2011), as well as delinquent behaviors (Boisvert, Wright, Knopik, & Vaske, 2012). Thus, it is reasonable to assume that parental bonding, experienced through expressiveness and overprotection, can be linked to self-efficacy.

Self-efficacy not only has been related to parental bonding but also to substance use. In general, increases in self-efficacy are associated with decreases in substance use (for review, see Kadden & Litt, 2011). However, even after focusing on a specific domain of behavior (i.e., substances use), there are no standardized measures for the concept. Accordingly, the majority of studies operationalize self-efficacy as a single item or scale unique to each study (Kadden & Litt, 2011). This diversity of measurement may be justified for at least two reasons. First, the concept is intuitive and easily understood by participants, making it simple to create customized measurement items that precisely fit the study context. Second, SCT posits that self-efficacy is domain-specific (for review, see Bandura, 2006; Strecher, DeVellis, Becker, & Rosenstock, 1986), implying that adolescent beliefs about their capacities in one domain may not transfer to another. Inasmuch as each study examines a domain within unique contexts or populations (e.g., samples), customized measures may be required. The current study of Nicaraguan adolescents, then, uses two measures.

Building from PST and SCT, two domains of self-efficacy are tested: *alcohol decision-efficacy* and *alcohol refusal-efficacy*. *Decision-efficacy* refers to adolescents' beliefs in their ability to control whether or not they drink alcohol, whereas *refusal-efficacy* is whether or not adolescents believe they can refuse alcohol when offered by others. Previous research shows that those who feel they have individual control of whether they drink have lower risk for alcohol use (e.g., Cavaola & Desordi, 2000; Cavaola & Strohmetz, 2010). This finding indicates that decision-efficacy is related to adolescents' confidence in expressing personal agency over alcohol use.

Recent studies also discovered that higher refusal-efficacy, measuring beliefs about an adolescent's ability to resist alcohol offers, led to lower reports of adolescent alcohol use (Choi, Krieger, & Hecht, 2013; Kam & Middleton, 2013). As PST purports, parent communication through bonding influences adolescents' beliefs. Testing this claim, we expect two forms of parent communication (i.e., expressiveness and overprotection) will be positively related to two forms of self-efficacy beliefs (i.e., decision-efficacy and refusal-efficacy), which in turn, will be negatively related to alcohol consumption. Thus, two research hypotheses are provided:

H1a: Expressiveness indirectly relates to adolescent alcohol use through decision-efficacy.

H1b: Expressiveness indirectly relates to adolescent alcohol use through refusal-efficacy.

H2a: Overprotection indirectly relates to adolescent alcohol use through decision-efficacy.

H2b: Overprotection indirectly relates to adolescent alcohol use through refusal-efficacy.

### ***Substance specific communication***

Another argument that has surfaced in studies of family communication and adolescent substance use centers on the role of specific conversations about substances (e.g., van der Vorst, Burk, & Engels, 2010; van der Vorst et al., 2005), which can be considered substance specific prevention communication (SSPC). This focus has largely been advanced by Miller-Day and colleagues and includes both qualitative descriptions of parent-child conversations about substances (e.g., Miller-Day, 2008; Miller-Day & Dodd, 2004; Pettigrew et al., 2013) and quantifications of how focused conversations relate to substance-use beliefs and behaviors (e.g., Kam & Middleton, 2013; Kam, Potocki, & Hecht, 2012; Miller-Day & Kam, 2010). This line of work has investigated conflicting verbal and nonverbal messages (e.g., “do as I say, not as I do”) (Ebersole, Miller-Day, & Raup-Krieger, 2014; Kam, Basinger, & Abendschein, 2015) and the importance of family rules surrounding substance use (Mares, Lichtwarck-Aschoff, Burk, van der Vorst, & Engels, 2012; Miller-Day, 2008).

Similarly, Kam and colleagues (e.g., Kam et al., 2015; Kam & Middleton, 2013) have looked at mediated effects of SSPC through adolescents’ pro- or anti- alcohol norms. Parental norms about delinquent behavior can influence adolescent views of those behaviors (Mayberry, Espelage, & Koenig, 2009), and in several studies, Kam and colleagues (Kam et al., 2012; Kam & Yang, 2013) found that SSPC was related to adolescent-reported anti-use norms that mirrored those of their parents. In addition, another study revealed significant indirect effects of expressiveness on adolescent substance use through parent-child communication about media portrayals of substance use and personal anti-use norms (Shin & Miller-Day, 2012). Across studies, it is clear that when parents directly address the issue of substance use with their adolescent children, it serves as a protective factor.

Building on PST, two lines of reasoning support the claim that SSPC mediates the relationship between the parent-child bonding and substance use. First, SSPC, when it occurs, happens within the context of family bonds. For example, it is plausible that if high levels of expressiveness and low levels of overprotection characterize adolescents’ family climates, SSPC efforts are more likely to take place (see Choi et al., 2017) and be heeded by adolescents, leading to decreased alcohol use. Conversely, adolescents in family environments low in expressiveness and high in overprotection are less likely to experience SSPC (see Choi et al., 2017) or heed them, ultimately leading to increased substance use. Second, communication of warmth and control may be domain-specific. Without SSPC, adolescents may never transfer their generalized perceptions of warmth and control to specific domains of behavior. For example, an adolescent may never violate his or her curfew because the parent sets clear expectations about that specific behavior, yet he or she may still engage in substance use due to a lack of clear expectations about it. In this respect, even in families with high levels of control or warmth, adolescents may still engage in substance use without SSPC. Thus, it is possible that family bonding through expressiveness and overprotection may have differential associations with SSPC, which might be related to lesser degrees of adolescent alcohol use.

Thus, the following predictions are provided:

H3a: Expressiveness indirectly relates to adolescent alcohol use through parental substance specific prevention communication.

H3b: Overprotection indirectly relates to adolescent alcohol use through parental substance specific prevention communication.

The current study aims to contribute to the field of family communication by exploring tenets of an important theory within an unexamined, culturally distinct population. It also adds to the global substance-use prevention literature by providing a close look at how interactional processes in the family can promote or deter alcohol use among Nicaraguan adolescents.

## Methods

### Procedures

Data were collected as part of a larger project to develop and deploy substance use and violence prevention programming in the Pacific (western) region of Nicaragua. For this study, data came from cross-sectional surveys with 7th and 8th grade students across 18 private schools and five community groups located in three cities (Managua, Masaya, and Granada). Participating organizations informed parents about the study and active consent procedures were used combined with participant assent. These procedures resulted in an individual response rate of 53%, similar to average response rates reported across similar types of studies (Baruch & Holtom, 2008; Ellwood, Asher, & Stewart, 2010). Students were surveyed in April, May, and June of 2015 prior to beginning intervention programming.

A trained research team administered paper and pencil questionnaires written in the native language of the participants during school hours. The survey included a three-form, planned missing design (Graham, Hofer, & MacKinnon, 1996), where students completed one of three versions of the survey. One block of items measuring core variables (e.g., substance use) appeared on all the surveys and three additional blocks of items (AB, AC, BC) were given to different subsets of students.

Paper surveys were collected and entered into an electronic database by hand. After data were entered, the data set was checked by a third party and any errors corrected. A university institutional review board approved all procedures.

### Participants

A total of 499 participants completed the survey. Participants were evenly divided by grade (52% 7th grade; 48% 8th grade) and sex (51% female; 49% male) with a mean age of 12.94 years ( $SD = .94$ ). The vast majority of participants identified as Hispanic or Latino/a (66%) or a mix of Hispanic or Latino/a and one other ethnicity (14%). About 7% identified as non-Latino/a White, 3% as Asian/Pacific Islander, 2% as Black, and 8% indicated another ethnicity.

### Measures

Scales were used to measure key variables. Means, standard deviations, and correlations among variables are reported in Table 1. The survey measures underwent a back translation process performed by the research team and then performed a second time by the university institutional review board, providing independent verification of scale accuracy.

### Overprotection

Three items were used to assess overprotection (Parker, Tupling, & Brown, 1979) using a 4-point scale response option (1 = no, never, 4 = yes, all the time). Items were prefaced with: "How often do the following happen in your family...?" Items included: "tend to baby you," "be overprotective of you," and "not let you go out as often as you wanted." Cronbach's alpha was 0.63.

**Table 1.** Means, standard deviations, and correlations among variables.

	Mean	SD	1	2	3	4	5	6
1. Overprotection	2.26	0.88	1	.17**	.22**	.08	.03	.10*
2. Expressiveness	2.32	1.10		1	.44***	.08	.09	-.15**
3. SSPC	2.14	1.04			1	.13	.07	-.06
4. Decision-Efficacy	2.82	1.54				1	-.09	.14*
5. Refusal-Efficacy	2.01	1.39					1	.05
6. Lifetime Alcohol Use	2.62	2.28						1

Note. \* $p < .05$ , \*\* $p < .01$ . Expressiveness, alcohol decision-eficacy, and alcohol refusal-eficacy were measured on a 5-point scale, parental overprotection and substance specific prevention communication (SSPC) on a 4-point scale, and lifetime alcohol use on a 10-point scale.

### **Expressiveness**

The expressiveness scale used an adapted version of the Conversation Orientation subscale of the Family Communication Environments questionnaire (Fitzpatrick & Ritchie, 1994) and included six items rated from 1 (*never*) to 5 (*all the time*). Items were prefaced with the question: “How often do these things happen?” A sample item was “My parents ask my opinion when the family is talking about something.” Cronbach’s alpha was 0.89.

### **Parental substance specific prevention communication**

Six items of Miller-Day and Kam (2010) were used to measure substance specific prevention communication, using a 4-point scale response option (1 = no, never, 4 = yes, all the time). Items followed the stem, “Does at least one of your parents ever. . .” Sample items included, “tell you stories of people who drink alcohol or have been drunk?” and “make comments about how drinking alcohol is bad if a character on TV is drinking or drunk?” Cronbach’s alpha was 0.94.

### **Alcohol decision-efficacy**

Alcohol decision-efficacy measured how much control participants perceived over whether or not they used alcohol and was based on previous measures (Cavaola & Desordi, 2000). Four items were rated from 1 (*never true*) to 5 (*true all the time*) and included the preface “How often do you feel that the following statements are true of you?” Items included, “You are in control of whether or not you drink alcohol” and “You can resist pressure to drink alcohol.” Cronbach’s alpha was 0.86.

### **Alcohol refusal-efficacy**

Following Choi et al. (2013) (see also Hays & Ellickson, 1990; Kam & Middleton, 2013), the measure of alcohol refusal efficacy included items that assessed how confident participants were they could refuse alcohol if offered by different individuals. The scale included six items rated from 1 (*not at all sure*) to 5 (*completely sure*). Items were prefaced with the statement: “How sure are you that, *if you really wanted to*, you could say no, if. . .” Sample items included alcohol offers from a “close friend,” “family member,” and “someone you find attractive.” Cronbach’s alpha was 0.96.

### **Lifetime alcohol use**

A single item with a 10-point scale response option (1 = none, 10 = more than 100 drinks) was used to ask the participants’ alcohol use in their lifetime (Hansen & Graham, 1991). Due to the nature of a single item, the reliability was not able to be tested. Past studies support the claim that a single item measure for the substance use report is common (Elek, Miller-Day, & Hecht, 2006; Shin et al., 2016) and effective (Hansen & Graham, 1991).

### **Control variables**

We also measured age and sex as control variables. Responses options for age ranged from 11 years to 16 and older in annual increments. Self-reported sex was measured as male or female.

### **Missing data**

Missing data primarily resulted from the planned-missing survey design, which can be assumed to be missing at random (MAR: Graham, Cumsille, & Elek-Fisk, 2003). Given that full information maximum likelihood estimation (FIML) yields more accurate estimation than traditional missing procedures (e.g., listwise and pairwise deletion) (Graham et al., 2003), FIML was performed to manage missingness.

## Analysis summary

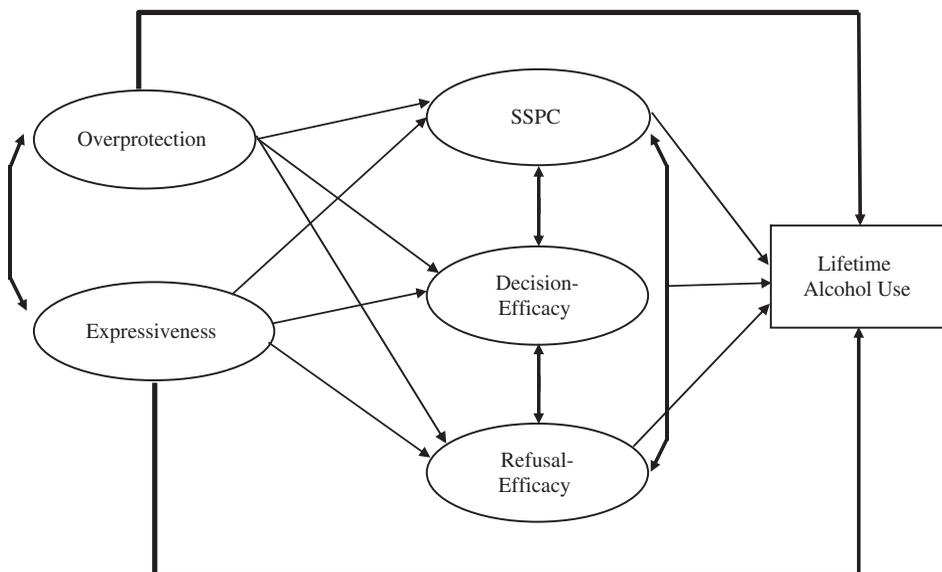
Before testing the mediated associations of parental SSPC, decision-efficacy and refusal-efficacy between overprotection, expressiveness, and lifetime alcohol use, we first ran a confirmatory factor analysis (CFA) to test the measurement model of overprotection, expressiveness, SSPC, decision-efficacy, and refusal-efficacy. The root mean square error of approximation (RMSEA)  $< .08$ , the comparative fit index (CFI)  $> .95$ , and the standardized root mean square residual (SRMR)  $< .08$  were used to test the fitness of the data (Hu & Bentler, 1999; Kline, 2005; Yu, 2002). Using *MPlus* 7.1 (Muthén & Muthén, 2012), the CFA model fit the data well [ $\chi^2(290) = 582.89, p < .001, RMSEA = .05, 90\% CI = .04, .05, CFI = .96, SRMR = .07$ ].

Next, structural equation modeling (SEM) with the measurement model was conducted to test the indirect relationships of overprotection and expressiveness on adolescent lifetime alcohol use via SSPC, decision-efficacy, and refusal efficacy. We originally included sex and age as the control variables in the SEM analysis. Neither of these variables were significantly related to other variables in the model, and they resulted in a poorer fitting model. Thus, we excluded these control variables in subsequent analyses. Our final model tested direct paths from overprotection and expressiveness to SSPC, decision-efficacy, and refusal-efficacy; paths from SSPC, decision-efficacy, and refusal-efficacy to lifetime alcohol use; and paths from overprotection and expressiveness to lifetime alcohol use (See Figure 1 for the conceptual model).

The analysis yielded a good model fit [ $\chi^2(287) = 571.12, p < .001, RMSEA = .05, 90\% CI = .039, .050, CFI = .96, SRMR = .06$ ]. To test the indirect associations of overprotection and expressiveness on lifetime alcohol use, 1000 bias corrected bootstrap samples were utilized for the tests of 95% bootstrap percentile confidence intervals. A significant indirect effect can be detected if confidence intervals do not span zero (Preacher & Hayes, 2008).

## Results

The first hypotheses posed that expressiveness would indirectly relate to adolescent alcohol use through decision-efficacy as well as refusal-efficacy. Neither H1a nor H1b were supported. Interestingly, however, decision-efficacy was significantly positively related to lifetime alcohol use ( $b = .19, SE = .07, p < .01$ ).



**Figure 1.** A conceptual model from the perspective of early adolescents in Nicaragua. *Note.* SSPC denotes substance specific prevention communication.

The second hypothesis posited that overprotection would indirectly relate to adolescent alcohol use through decision-efficacy, as well as refusal-efficacy. There was no evidence found to support H2.

The third hypothesis postulated that expressiveness (H3a) and overprotection (H3b) would indirectly relate to adolescent alcohol use through SSPC. Results provide support for H3a but not H3b. Expressiveness was significantly positively related to SSPC ( $b = .44, SE = .06, p < .001$ ), whereas overprotection showed a non-significant association with SSPC ( $b = .07, SE = .08, ns$ ). SSPC was significantly negatively related to lifetime alcohol use ( $b = -.15, SE = .07, p < .05$ ).

The test of 95% confidence interval revealed an indirect relationship between expressiveness and lifetime alcohol use through SSPC (indirect  $b = -.20$ ; 95% CI:  $-.458, -.017$ ). The more expressive adolescents were with their family, the more likely adolescents were to engage in SSPC, which in turn, was related to lower lifetime alcohol use. However, no other indirect relationships were found. See [Figure 2](#) for the SEM results.

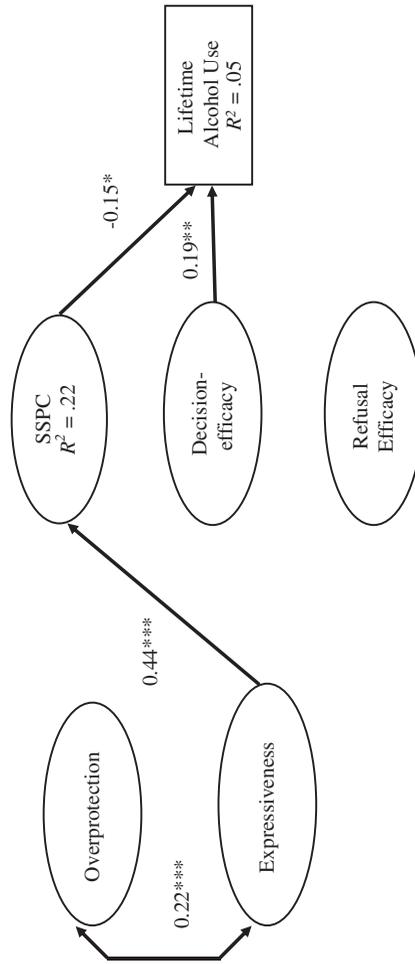
## Discussion

Family communication can have a substantive influence on adolescent substance use (Becoña et al., 2012) and, according to PST, this influence can be mediated through adolescent dispositions and beliefs. Our analyses showed little support for this general hypothesis based on PST. Instead, the important role of SSPC was detected in our data. Specifically, the findings revealed that parental expressiveness was significantly, indirectly related to alcohol use through SSPC, while no significant indirect path was found between parental bonding and alcohol use via decision-efficacy or refusal-efficacy. Finally, a significant direct relationship between decision-efficacy and alcohol use was discovered, but in an unexpected direction. In this section, we focus on the role of family communication on adolescent alcohol use, but first, we elaborate on the positive relationship between decision-efficacy and alcohol use.

### Decision-efficacy

Results indicated that decision-efficacy positively related to alcohol use for adolescents in our sample. That is, the more early adolescents felt confident that they could make a choice about alcohol use, the more alcohol they reported drinking. Although unexpected, our finding partly replicates Choi et al. (2013). Both this study and Choi et al. (2013) found a positive, significant relationship between a measure of adolescent efficacy and alcohol use; however, the current study found that *alcohol* decision-efficacy was significantly associated with lifetime alcohol use, whereas Choi et al. (2013) found a positive relationship between *marijuana* resistance self-efficacy (not *alcohol* resistance self-efficacy) and alcohol use.

Differences between our finding and previous research (Choi et al., 2013) could be explained in two ways. First, methodological anomalies may explain our findings. For example, decision-efficacy was measured differently than response efficacy: the present study measured a general belief in one's ability to decide to drink alcohol or not, whereas Choi et al. (2013) tested one's ability to resist alcohol or marijuana offers through enacting four specific resistance strategies. Another possible explanation for the difference is cultural. The previous study analyzed data from a U.S. sample, whereas our data come from a sample of early adolescents in Nicaragua. It could be that self-efficacy, in general, fits best as a mediator in contexts where individual autonomy and decision-making are privileged over deference to others. Alternatively, following the logic of Choi et al. (2013), it is possible that early adolescents with more exposure to substance-use offers were more confident in their ability to effectively resist the offer (regardless of how often they actually did so) compared with early adolescents who had not been exposed to as many substances or offers. Nicaraguan early adolescents might be more frequently exposed to offers and opportunities to decide whether or not to use alcohol than U.S. early adolescents, which would lead to more decision-efficacy. If this is the case, developing decision- or refusal-efficacy is not as important as developing anti-substance-use



**Figure 2.** SEM results. Note.  $^*p < .05$ ;  $^{**}p < .01$ ;  $^{***}p < .001$ . Regression coefficients in the figure are standardized, and for reasons of clarity, only significant pathways and correlations are shown here ( $\chi^2[287] = 571.12$ ; RMSEA = .05; CFI = .96; SRMR = 0.06). SSPC = substance specific prevention communication.

norms. Future research might look at the interaction between personal norms (pro- or anti-substance-use) and efficacy measures. Such a model might speculate that anti-substance-use norms and high levels of decision-efficacy would be most protective against substance use in Nicaragua.

Another possible explanation for the significant relationship between efficacy and alcohol use is that those with low decision-efficacy may defer to an outside authority (e.g., parents) for making substance use decisions. For example, if family members communicate clear anti-drinking norms to which early adolescents defer, then early adolescents may not consider drinking a personal choice, which would correspond to lower levels of decision-efficacy. Or, as is sometimes the case in Nicaragua, when attending a party where parents or other adults are present (Pettigrew et al., 2015), early adolescents may seek permission to drink alcohol leading to lower levels of decision-efficacy and generally lower usage rates. Conversely, when early adolescents feel independent of authority, they might report higher decision-efficacy and engage in more substance-use experimentation or assert more individuality. Following this logic, examining family rules about substance use (e.g., Mares et al., 2012; Miller-Day, 2008) and early adolescents' deference to these rules may clarify the relationship between decision-efficacy and substance use. Rules, however, are only one aspect of family communication, so we now turn to discuss the role of parent-child bonding.

### ***Family bonding through communication***

This study also examined the indirect association of parent-child bonding including expressiveness and overprotection with alcohol use through SSPC. Results show some important relationships. Previous research has argued that parental warmth (e.g., expressiveness) has an important impact on a number of developmental characteristics in adolescents (for reviews see Khaleque, 2013; Schrodt et al., 2008), but control (i.e., firm, clearly articulated limits) may better inhibit problematic behaviors such as substance use (Steinberg, 2001). Our results support the idea that different types of family bonding exert differential influence. Findings further clarify that family bonding can be mediated by other influential factors, such as SSPC, and allude to the importance of confrontive control over coercive control (see Baumrind, 2013).

Family bonding that was viewed as overprotective, in our model, did not significantly relate to adolescent alcohol use directly or indirectly. Bivariate correlations showed significant direct association between overprotection and alcohol use, but in our analytical model this relationship was not significant. These null findings are encouraging when recalling that overprotection measured early adolescents' perceptions of coercive (intrusive, restrictive) control. When considered in isolation, coercive control may be problematic, but when a multidimensional view of family bonding was considered, early adolescents did not exhibit increased risk for alcohol use. Overprotection was not significantly positively or negatively related to alcohol use, which may also underscore the importance of encouraging confrontive (firm, instructive) control alongside warmth.

An expressive family was not directly significantly related to alcohol use but was indirectly associated with alcohol use through SSPC. When the goal is limiting adolescent alcohol use, it may not be sufficient to maintain an open, emotionally supportive environment. Indeed, some studies have shown no direct relationship between parental warmth and substance use (e.g., Montgomery, Fisk, & Craig, 2008), while others have noted open communication is a means of mitigating adolescent substance use (Kafka & London, 1991; Stronski, Ireland, Michaud, Narring, & Resnick, 2000). Perhaps when early adolescents feel able to express themselves in an open, emotionally supportive environment, they are less concerned with family sanctions, leading to more experimentation. Alternatively, they may feel more connected to parents and anti-substance-use values, leading to less experimentation. It seems, then, that limiting substances use requires not only bonded relationships but also substances specific communication.

The indirect relationship between expressiveness and alcohol use aligns with past studies suggesting that expressiveness is negatively related to adolescent substance use through discussions about substances (Miller-Day et al., 2012; Shin & Miller-Day, 2012) and also through communicating anti-use norms (Kam et al., 2015; Kam & Middleton, 2013; Kam & Yang, 2013; Shin & Miller-Day, 2012). It could be that SSPC is a proxy for the kind of confrontive control that provides instructive, firm limits. Thus, one could postulate that high levels of both expressiveness and SSPC would approximate an authoritative parenting environment (Baumrind, 2013; Rueter & Koerner, 2008; Steinberg, 2001) and would be the most protective family dynamic for early adolescents. This hypothesis seems to be supported in a separate study reported by Choi et al. (2017).

An alternative explanation for expressiveness's indirect association is that early adolescents develop behavioral dispositions within specific domains, rather than as generalized practice. Similar to efficacy, substance specific conversations are necessary and may be best facilitated by a highly expressive parent-child relationship. This reasoning suggests that to prevent other risky behaviors, such as unprotected sex, domain-specific conversations would be needed accordingly. Future research should examine relationships among expressiveness and different outcomes (e.g., substance use, sexual behaviors, vandalism, etc.) via prevention communication about each of these outcomes. Such a study could clarify the functional role of SSPC in family environments and would integrate the study of domain-specific conversations into extant theory (e.g., Baumrind, 1971, 2013; Koerner & Fitzpatrick, 2002; Steinberg, 2001).

### ***Limitations and directions for future research***

Although this study provides a unique insight into an understudied population, there are limitations that should be noted. First, we are unaware of any other studies that examine family communication in the Nicaraguan context. Due to limited research with this population, our findings are exploratory and should be interpreted with caution. The availability of alcohol and high drug trafficking through Nicaragua (Dormitzer et al., 2004; Dudley, 2010) encourages future scholarship to explore early adolescent substance use in this country and in similar areas. Second, recruitment and sampling procedures resulted in potential limitations. Only nongovernmental organizations were recruited in this study, meaning that no public schools participated. Although the private school system in Nicaragua is more varied than the private school system in the United States (for example, some private schools require a tuition in U.S. dollars of \$1/per month and others require over \$500/month), and participants were recruited through five youth service organizations that did enroll public school early adolescents, the sample is not a perfect representation of Nicaraguan early adolescents. Moreover, all schools and organizations were located on the Pacific side of the country where most of the population dwells; however, there are clear cultural differences between residences in the Pacific and Caribbean coasts. Findings more closely represent the Latino/a population of Nicaragua than the Afro-Caribbean or Garifuna populations. Additionally, the sample was relatively young (mean age = 13) and alcohol use rates were low. Although analysis resulted in some significant findings, effects might be limited.

In addition, longitudinal studies that track adolescents as they emerge into adulthood would shed light on how SSPC influences adolescent substance use within an understudied community. This study used cross-sectional data. Due to the nature of the study design, adolescents were asked to respond to survey items at the same time. Having SSPC predict lifetime alcohol use in a cross-sectional design means that the alcohol use could have actually occurred prior to SSPC. Despite this limitation, using the cross-sectional data for the mediation test is a commonly utilized method in the realm of family communication research (Kam et al., 2015; Miller-Day & Kam, 2010; Miller-Day et al., 2012). Future researchers can benefit from the longitudinal survey data when examining long-term effects of parental bonding, other mediating factors, and substance use behaviors over time.

## Conclusion

As this is one of the first studies to examine family communication and substance use with a Nicaraguan early adolescent sample, the extent to which findings are related to cultural phenomena is unclear. Future research is needed to clarify relationships presented. Notwithstanding, this study adds to understandings of theory and practice. In terms of PST, findings verify an indirect relationship between bonding and alcohol use; however, they call into question the usefulness of alcohol-specific efficacy, as suggested by SCT, as a mediator for early adolescents in a Nicaraguan context. Instead, findings underscore the importance of expressiveness and SSPC. Our findings highlight targets (e.g., increasing expressiveness, increasing SSPC) for prevention and intervention, and call for further research to clarify how decision- and refusal-efficacy operate vis-à-vis family rules and pro- or anti-substance-use norms. Overall, this study confirms the existing literature documenting that families remain a powerful influence on adolescent behaviors, although not through expected mediators. Thus, future work should endeavor to focus family influence for the betterment of adolescents and society.

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## ORCID

Jonathan Pettigrew  <http://orcid.org/0000-0001-7938-784X>

YoungJu Shin  <http://orcid.org/0000-0001-6751-8064>

James B. Stein  <http://orcid.org/0000-0002-2770-8223>

Lisa J. Van Raalte  <http://orcid.org/0000-0002-6424-910X>

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