

2-20-2018

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Recommended Citation

Shin, Y., Miller-Day, M., & Hecht, M. L. (2019). Differential effects of parental “drug talk” styles and family communication environments on adolescent substance use. *Health Communication, 34*(8), 801-810. <https://doi.org/10.1080/10410236.2018.1439268>

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This is an Accepted Manuscript of an article published in *Health Communication*, volume 34, issue 8, in 2019, available online at DOI: [10.1080/10410236.2018.1439268](https://doi.org/10.1080/10410236.2018.1439268). It may differ slightly from the final version of record.

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Running Head: PARENT-ADOLESCENT DRUG TALK STYLES

**Differential Effects of Parental “Drug Talk” Styles and Family Communication
Environments on Adolescent Substance Use**

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This publication was supported by Grant Number R01DA021670 from the National Institute on Drug Abuse to The Pennsylvania State University (Michael Hecht, Principal Investigator). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health. Correspondence should be addressed to YoungJu Shin, Hugh Downs School of Human Communication at Arizona State University, 950 S. Forest Mall PO Box 1205, Tempe, AZ 85287, U.S.A.; Phone Number: (+1-480) 965-6905; Fax Number: (+1-480) 965-4291; E-Mail: Youngju.Shin@asu.edu

Abstract

The current study examines the relationships among adolescent reports of parent-adolescent drug talk styles, family communication environments (e.g., expressiveness, structural traditionalism, and conflict avoidance), and adolescent substance use. ANCOVAs revealed that the 9th grade adolescents ($N = 718$) engaged in four styles of “drug talks” with parents (e.g., situated direct, ongoing direct, situated indirect, and ongoing indirect style) and these styles differed in their effect on adolescent substance use. Multiple regression analyses showed that expressiveness and structural traditionalism were negatively related to adolescent substance use whereas conflict avoidance was positively associated with substance use. When controlling for family communication environments and gender, adolescents with an ongoing indirect style reported the lowest use of substance. The findings suggest implications and future directions for theory and practice.

Keywords: drug talk styles, parent-child communication, family communication environments, youth substance use

Differential Effects of Parental “Drug Talk” Styles and Family Communication Environments on Adolescent Substance Use

Substance use among youth causes significant public health concerns because early use and abuse of substances in adolescence is strongly predictive of later misuse in adulthood (Newton-Howes & Boden, 2015; Spoth, Trudeau, Gyll, Shin, & Redmond, 2009). Many adolescents initiate substance use in middle school and then, as they grow older, substance use tends to increase drastically. For example, 8th grade students reported lifetime use of alcohol (23%), marijuana and hashish (14%), cigarettes (9%), and chewing tobacco (6%) that increases by the time they advance to 12th grade (Johnston et al., 2018). Adolescent substance use also is problematic due to its positive relationships with other delinquent behaviors such as bullying (Kuntsche, Knibbe, Engels, & Gmel, 2007) or early sexual intercourse (Paul, Fitzjohn, Herbison, & Dickson, 2000). Considering the severe health risks and social costs associated with adolescent substance use (American Cancer Society, 2017), strategic prevention efforts need to be made by targeting early adolescents (ages 11-14) to prevent their substance use (Choi, Krieger, & Hecht, 2013; Hargreaves, McVey, Nairn, & Viner, 2013).

Parents are often considered influential agents in preventing youth substance use (Shin & Miller-Day, 2017), with studies demonstrating the importance of understanding parent-child communication specifically regarding the topic of substance use (Baxter, Bylund, Imes, & Scheive, 2005; Boone & Lefkowitz, 2007; Kam & Middleton, 2013) as well as the effects of more general family communication environments (Pettigrew, Shin, Stein, & Van Raalte, 2017; Shin & Miller-Day, 2017) on youth substance use. Guided by a parent-offspring drug talk (PODT) model (Miller-Day & Dodd, 2004), the current study examines the role that parent-adolescent “drug talks” play as they are enacted within family environments. Thus, this study extends previous work by testing the links between youth perceptions of drug talk styles and family communication environments and substance use.

First, we discuss the positive role of parent-adolescent communication about substances before turning to family communication environments.

Parent-Adolescent Communication about Substances

Parent-adolescent communication remains one of the most important substance use prevention strategies (Choi et al., 2017; Miller-Day, 2008; Reimuller, Hussong, & Ennett, 2011) with family communication scholars documenting the protective role of parents as anti-drug socialization agents (Kelly, Comello, & Hunn, 2001; Shin, Lee, Lu, & Hecht, 2016, Shin & Miller-Day, 2017).

Drug Talks. Evidence shows that beyond the general quality of parent-adolescent communication in the family, “drug talks” or talk directly about substance use has significant effects on adolescent anti-drug norms, attitudes, intentions to use substances, and recent substance use behaviors (Kam & Yang, 2013; Miller-Day & Kam, 2010; Nash, McQueen, & Bray, 2005; Shin & Miller-Day, 2017). Choi et al. (2017) indicated that substance specific prevention communication (SSPC) refers to direct or indirect, preventive messages that focus on issues related to substances and substance use that may occur on an ongoing basis or at a few situated times during the adolescent’s development and have a significant impact on adolescent substance use.

Miller-Day and Dodd (2004) conceptualized a parent-offspring drug talk (PODT) model based on two key dimensions: timing and directness. The timing dimension refers to situated versus ongoing messages, whereas the directness dimension is defined as direct versus indirect messages (Pettigrew et al., 2018). A *situated direct* style of PODT is characterized by one-shot conversations explicitly commenting on drugs and drug use while an *ongoing direct* style carries repetitive conversations about drugs and drug use. A *situated indirect* style refers to conversations that imply verbal hints about drugs and drug use and display nonverbal cues of parental disapproval of adolescent drug use on a special occasion,

whereas an *ongoing indirect* style deliver messages using verbal and nonverbal hints about drugs and drug use repeatedly over time.

Miller-Day and Dodd's (2004) PODT model has made a substantial contribution to the scholarship of family communication because it was the first to explore specifically parent-adolescent communication about substance use and identify four different drug talk styles using the dimensions of timing and directness. Rather than general communication constructs such as openness and frequency of conversation that characterize previous work, this model demonstrated the importance that communication effectiveness is not topic invariant (Choi et al., 2017; Pettigrew et al., 2018; Shin, Pettigrew, Miller-Day, Hecht, & Krieger, in press).

However, despite its conceptual contribution, their original work was limited because their formative findings were based on college students' memory of conversations with parents during their adolescence. Young college students might recall conversations with parents if they were significant enough for them to remember in retrospect. It is possible, however, that college age students' memories may not accurately reflect parent-adolescent conversations. To extend this line of research, a recent study (Shin et al., in press) investigated youth perceptions of PODT and its longitudinal transitions over four different time points over two years. The findings suggested that adolescent reports of drug talk styles changed over time and parents tended to utilize a different drug talk style throughout the developmental period of adolescence, adapting their style over time. Many parents favored direct messages in early adolescence (e.g., beginning of 7th grade) and then tapered off to indirect messages as the student entered high school. Although Shin et al.'s research (in press) offered insight about the longitudinal transitions in parent-adolescent drug talk styles, their findings remained limited because the styles were not linked to adolescent substance use behaviors.

The present study seeks to fill a research gap by examining the associations between different drug talk styles and adolescent substance use. Guided by Miller-Day and Dodd's (2004) PODT model, this study tests if there are significant differences in adolescent lifetime substance use, depending on drug talk styles. The following is the first study hypothesis:

H1: There will be significant differences in adolescent lifetime substance use, depending on drug talk styles.

Drug talks do not exist in isolation. Rather, over time, they emerge from family environments that provide a context for these talks. We now turn to discuss the importance of family communication environments in adolescent substance use.

Family Communication Environments

The theoretical construct of family communication environments (FCE) is derived from family communication patterns research (Ritchie, 1991; Ritchie & Fitzpatrick, 1990) and identifies expressiveness, structural traditionalism, and conflict avoidance as key dimensions of communication climate (Fitzpatrick & Ritchie, 1994; Koerner & Fitzpatrick, 2002a). The expressiveness dimension suggests variant levels of open communication between parent and adolescent and structural traditionalism characterizes parents as emphasizing parental power and obedience. The dimensions emerge in juxtaposition with the conflict avoidance that emphasizes family harmony while suppressing conflict (Burns & Pearson, 2011; Fitzpatrick & Ritchie, 1994).

Prior studies show that there were differential effects of FCE dimensions on family functioning and well-being (Baxter et al., 2005; Koesten, Schrod, & Ford, 2009; Schrod, 2005, 2009). For instance, the dimension of expressiveness predicted positive family outcomes (Burns & Pearson, 2011; Schrod, 2005), whereas structural traditionalism and conflict avoidance were negatively associated with family functioning (Schrod, 2005, 2009). Although it is evident that FCE plays a key role in family interactions, less attention has been

paid to understanding its role in adolescent substance use prevention research and, in particular, as the context for drug talks. It seems logical that different family communication environments would provide substantively diverse contexts for addressing a difficult topic such as adolescent substance use.

Yet, to-date there has been little research investigating if these differing contexts diverge in their approaches to parent-adolescent drug talks. The few studies that have examined FCE and drug talks have found differences across the FCE dimensions (Choi et al., 2017; Pettigrew et al., 2017; Shin & Miller-Day, 2017). Pettigrew et al.'s study (2017) indicated that the expressive family communication environment was positively related to substance specific communication, which in turn led to decreases in lifetime alcohol use of adolescents in Nicaragua. Choi et al. (2017) conducted a longitudinal examination of parental expressiveness and adolescent substance use in the US and discovered that family environments that were generally expressive (open), with parents who directly addressed the topic of substances and substance use (active) was the most effective combination overall to prevent adolescent substance use, with the least effective being family environments that were not expressive (silent) and with parents who avoided directly addressing the topic of substances or substance use (passive).

Furthermore, Shin and Miller-Day (2017) revealed that the significant indirect effects of expressiveness on adolescent recent substance use were detected through both paths of parental anti-substance-use injunctive norms (parental disapproval) and personal anti-substance-use norms as well as parent-adolescent prevention communication about substance use in the media and personal anti-substance-use norms. On the other hand, the indirect effects of structural traditionalism were found via one path only from parent-adolescent prevention communication about substance use in the media to personal anti-substance-use norms. That is, as adolescents report higher levels of expressiveness and structural

traditionalism, their recent substance use behaviors decrease. However, conflict avoidance did not show significant indirect effects on adolescent substance use behaviors yet it did yield support for a direct effect on parental anti-substance-use injunctive norms only. These findings support the claim that the three dimensions of FCE predict differential outcomes. In other words, the effects of FCE are manifested through different processes of anti-substance-use socialization. Based on the recent literature, the present study posits the second hypothesis:

H2: There will be significant differences in adolescent lifetime substance use in relation to family communication environments.

Given our hypothesized emphasis on parental messages about substances (drug talks), it is important to examine the relationship between drug talks and family communication environments. If we are correct then drug talks should demonstrate an effect above and beyond that associated with family communication environments. As result, we posted a third hypothesis examining whether differences of adolescent lifetime substance use based on drug talk styles are independent of family communication environments.

H3: There will be significant differences in adolescent lifetime substance use, depending on drug talk styles when controlling for family communication environments.

Methods

Participants and Procedure

Cross-sectional survey data were collected as part of a larger study evaluating a school-based drug prevention intervention in two Midwestern states (Colby et al., 2013; Pettigrew et al., 2014). Design limitations restricted the study to cross-sectional data, the limitations of which are discussed below. Forty-five minute, paper-pencil surveys were administered by university research personnel. Prior to the data collection, the hosting

university institutional review board approved all procedures of the present study and passive parental informed consent and active student assent forms were obtained.

Ninth grade students in the control condition constituted the current sample ($N = 718$). These students did not receive any school-based substance use interventions during the time of data collection. The mean age for the participating students is 14.68 years ($SD = .58$) and 53.1% are male. A majority of participants self-identified themselves as European American (94%), African American (3%), Hispanic (2%), and Asian or Pacific Islander (1%).

Measures

Parent-adolescent drug talk styles. Guided by Miller-Day and Dodd's (2004) PODT model, a single item measure with four categorical response options was created to assess adolescent perceptions of each of the drug talk styles. Students were asked to respond to the item, "Please indicate which of the following scenarios most resembles how your parent has talked with you about alcohol, tobacco, or other drug use." Choices reflects the four drug talk styles as well as not having had such a talk: (1) "We have participated in 1-2 specific conversations about alcohol and other drugs, with my parent(s) providing me with information, guidelines, or advice" (*situated direct*), (2) "We participated in many conversations about alcohol and other drugs, with my parent(s) providing me with information, guidelines, or advice" (*ongoing direct*), (3) "I recall a few times when my parent(s) hinted to me in an indirect way about alcohol and other drugs without really providing me with any information, guidelines, or advice" (*situated indirect*), (4) "My parent(s) very often hinted me to in an indirect way about alcohol and other drugs without really providing me with any information, guidelines, or advice" (*ongoing indirect*), and (5) "My parent(s) never talked with me about alcohol and other drugs," ("*never talk*"). The participating students reported 14% situated direct style ($N = 97$), 16% ongoing direct style ($N = 118$), 36% situated indirect style ($N = 256$), and 34% ongoing indirect style ($N = 247$).

No one reported “never talk”.

Family communication environments. Fourteen items were adapted from Fitzpatrick & Ritchie’s (1994) measure to assess three dimensions of FCE. Items from the adult version of the measure were modified to make them age appropriate for the current sample. For example, modified items asked “My parents encourage me to express my feelings” rather than “I encourage my child to express his/her feelings”. Respondents used a five-point response scale ranging from never to all the time. Higher scores indicated a stronger association with each dimension. Cronbach’s alpha was 0.91 for expressiveness ($M = 2.70$, $SD = 1.11$), 0.79 for structural traditionalism ($M = 3.12$, $SD = .97$), and was 0.80 for conflict avoidance ($M = 2.28$, $SD = 1.15$) respectively.

Lifetime substance use. Hansen and Graham’s scale (1991) was used to ask about adolescent substance use of alcohol, cigarette, marijuana and chewing tobacco in their lifetime. Students responded to four questions asking amount of substance use respectively. For example, the items asking the amount of alcohol use were answered by 9-point scale (e.g., “How many drinks of alcohol have you had in your entire life?”, A “drink” = 1 bottle or can of beer, 1 glass of wine, or 1 shot of hard liquor) (1 = None. I have never had even one sip of alcohol to 9 = more than 100 drinks) ($M = 4.16$, $SD = 2.95$). Using 10-point scale, cigarette use was asked (e.g., “How many cigarettes have you smoked in your entire life?”) (1 = None. I have never had even one puff to 10 = More than 20 packs of cigarettes) ($M = 2.94$, $SD = 3.00$). Marijuana uses were asked with 7-point scale (e.g., “How many times have you used marijuana in your entire life?”) (1 = Never. I have never used marijuana even once to 7 = more than 30 times) ($M = 1.74$, $SD = 1.49$). Chewing tobacco was answered by 8-point scale (e.g., How many times have you used chewing tobacco (chew, snuff, plug, dipping tobacco) in your entire life?) (1 = Never to 8 = More than 50 times) ($M = 2.04$, $SD = 2.13$). Higher scores indicated more use of substance.

Gender. Previous research well documents the differential effects of gender on substance use research (Evans, Grella, Washington, Upchurch, 2017; National Institute on Drug Abuse, 2016). Thus, gender (1 = male; 2 = female) was included as a controlling variable for analyses.

Analysis summary

Using SPSS software program, three sets of analyses were utilized to answer three research hypotheses. To address the first hypothesis, a series of analyses of covariance (ANCOVAs) were performed to test if there were significant differences in adolescent lifetime substance use depending on parent-adolescent drug talk styles. Gender was included as a covariate. To answer the second hypothesis, a series of multiple linear regressions were run to examine the relationships among three dimensions of FCE and adolescent lifetime substance use. Gender was included, again, as a covariate. Lastly, to test the third hypothesis, a series of analysis of covariance (ANCOVAs) were conducted to test the differences in lifetime substance use based on drug talk styles, while controlling for FCE and gender as covariates.

Results

Four sets of ANCOVA were calculated using adolescent perceptions of drug talk styles as the independent variable and adolescent lifetime use of alcohol, cigarette, marijuana, and chewing tobacco as the dependent variables respectively. Significant differences were detected in lifetime alcohol use [$F(3, 696) = 14.86, p < .001, \eta^2 = .06$], lifetime cigarette use [$F(3, 701) = 21.79, p < .001, \eta^2 = .085$], lifetime marijuana use [$F(3, 698) = 14.19, p < .001, \eta^2 = .057$], and lifetime chewing tobacco use [$F(3, 701) = 4.30, p = .005, \eta^2 = .018$]. Overall, adolescents reporting their perceptions of parents' ongoing direct style showed the highest use for lifetime alcohol, cigarette, and marijuana followed by situated direct, situated indirect, and ongoing indirect style. With regard to lifetime chewing tobacco use, adolescents

reporting their perceptions of parents' a situated direct style showed the highest use, followed by ongoing direct, situated indirect, and ongoing indirect style. Next, Fisher's Least Significant Difference (LSD) post hoc analysis was conducted to compare differences of each style on substance use behaviors. Table 1 shows the descriptive means of lifetime substance use and ANCOVA results with the post-hoc analysis comparisons among four drug talk styles.

Next, a series of multiple regression analyses were performed to test if the three dimensions of FCE as the independent variables predicted adolescent lifetime use of alcohol, cigarette, marijuana, and chewing tobacco, while controlling for gender. Four sets of regression analyses revealed significant relationships for lifetime alcohol use [$F(4, 678) = 11.55, p < .001$], lifetime cigarette use [$F(4, 682) = 10.30, p < .001$], lifetime marijuana use [$F(4, 679) = 8.85, p < .001$], and lifetime chewing tobacco use [$F(4, 682) = 27.34, p < .001$]. The analysis models explained approximately 6% of the variance for lifetime alcohol use, 6% of the variance for lifetime cigarette use, 5% of the variance for lifetime marijuana use, and 14% of the variance for the lifetime chewing tobacco use. The dimension of expressiveness was significantly and inversely related to lifetime alcohol use ($\beta = -.18, p < .001$), cigarette use ($\beta = -.15, p < .001$), marijuana use ($\beta = -.10, p = .013$), and chewing tobacco use ($\beta = -.08, p = .028$). Structural traditionalism was significantly and inversely associated with lifetime cigarette use ($\beta = -.20, p < .001$) and marijuana use ($\beta = -.18, p = .001$) as well as moderately and inversely related to chewing tobacco use ($\beta = -.09, p = .062$). Conflict avoidance was significantly but positively associated with lifetime cigarette use ($\beta = .18, p < .001$), marijuana use ($\beta = .15, p = .003$) and chewing tobacco use ($\beta = .13, p = .009$), as well as moderately and positively related to alcohol use ($\beta = .10, p = .059$). That is, family environment characterized by expressiveness and structural traditionalism saw less substance use while those characterized by conflict avoidance saw more substance use. Figure 1

presents the regression results.

Finally, four sets of analyses of covariance (ANCOVA) were conducted to test the differences of lifetime substance use based on drug talk styles, while controlling for FCE and gender as covariates. After controlling for these variables, significant differences were noted in lifetime alcohol use [$F(3, 666) = 9.40, p < .001, \eta^2 = .041$], lifetime cigarette use [$F(3, 670) = 14.12, p < .001, \eta^2 = .059$], lifetime marijuana use [$F(3, 667) = 8.86, p < .001, \eta^2 = .038$], and lifetime chewing tobacco use [$F(3, 670) = 2.68, p = .046, \eta^2 = .012$]. The analysis models explained approximately 10% of the variance for lifetime alcohol use, 11% of the variance for lifetime cigarette use, 9% of the variance for lifetime marijuana use, and 15% of the variance for the lifetime chewing tobacco use. Fisher's Least Significant Difference (LSD) post hoc analysis revealed major comparisons as following: that is, youth reporting a situated direct style showed higher uses of alcohol, cigarette, and chewing tobacco than a situated indirect style. Youth reporting an ongoing direct style showed higher uses of alcohol, cigarette, marijuana, and chewing tobacco than an ongoing indirect style. Youth reporting an ongoing direct style showed higher uses of alcohol, cigarette, and marijuana use than a situated indirect style. Youth reporting a situated direct style showed higher uses of alcohol, cigarette, marijuana, and chewing tobacco than an ongoing indirect style. Table 2 shows ANCOVA results with the post-hoc analysis comparisons among four drug talk styles.

Discussion

The present study describes the relationships among parent-adolescent drug talk styles, FCE, and adolescent lifetime substance use. Guided by Miller-Day and Dodd's PODT model (2004) and building on Shin et al. (in press) and Choi et al. (2017) research, the findings reveal that four drug talk styles and three dimensions of FCE had differential effects on adolescent lifetime use of alcohol, cigarette, marijuana, and chewing tobacco.

Drug Talk Findings

Overall, an ongoing indirect style (e.g., hinting; nonverbal cues) resulted in the least alcohol, cigarettes, or marijuana use. This style of drug talk plays a more positive role than direct messages, a finding which contracts the past literature (Miller-Day & Kam, 2010; Shin et al., 2016). This surprising finding may be explained in a number of ways. Because the data reflect a cross-sectional survey of youth at the end of 9th grade, it is plausible to assume that the participating students have been participating in talking about substance use with their parents for several years. This is consistent with past studies revealing that parents tend to initiate a situated direct and indirect drug talk early in adolescence such as the beginning of 7th grade (Pettigrew et al., 2018; Shin et al., in press) and then transition their drug talk style to an ongoing indirect style as adolescents grow older (Shin et al., in press). By high school, indirect messages may replace more direct messages, serving as consistent reminders, reinforcing the direct messages and expectations articulated in early adolescence.

Additionally, it could be that the 9th graders whose parents are directly discussing substance use with their child are those who have already initiated use; hence, those students receiving these direct drug talks would be associated higher use. Alternatively, parental information, guidelines, or advice may have heightened the adolescent's interest in experimenting with alcohol, cigarettes and marijuana. Future research should investigate parent-adolescent drug talks and adolescent substance use at specific developmental stage ranging from 7th grade to 12th grade and test whether a particular drug talk style remains significantly protective or generates a boomerang effect on adolescent substance use behaviors. Other theoretical frameworks might be useful to future research to further understand these unexpected findings. Some suggestions might be Reactance Theory (Brehm & Brehm, 1981) to understand possible reactance to parents' controlling language used in direct messaging about substance use as youth move into middle adolescence or Inconsistent

Nurturing as Control Theory (Le Poire, 1995) to better understand the actual indirect and direct strategies parents are employing for substance use prevention as well as intervention.

Family Communication Environments Findings

The second major finding is that the FCE dimensions posited in previous research also are related to substance use. Consistent with other studies, expressiveness was significantly related to lower levels of use for all four substances while conflict avoidance was related to higher levels of use. However, structural traditionalism was significantly associated with lower lifetime levels of substance use, except alcohol. This finding reinforces other research highlighting expressiveness' positive role in family functioning and children's well-being (Burns & Pearson, 2011; Schrodt, 2005). It is reasonable to speculate that parents in an expressive family environment tend to invite a wide range of conversational topics including substance use and further encourage adolescents to share their opinions about such topics across adolescence.

Structural traditionalism was related to lower degrees of cigarette, marijuana, and chewing tobacco use, implying that adolescents in the family environment placing stronger value of family harmony and children's obedience to their parents reported the lesser degrees of cigarette, marijuana, and chewing tobacco use. Children raised in this environment learn to accept parental control and are socialized to follow parental rules about anti-substance-use. Previous research suggests that families with high levels of structural traditionalism may outline rules, consequences, and parental expectations about substance use in early adolescence (Choi et al., 2017).

Finally, conflict avoidance was positively associated with adolescent substance use behaviors, meaning that as adolescents reported more conflict avoidance in family communication, they were more likely to partake of alcohol, cigarette, marijuana, and chewing tobacco. These findings are consistent with previous literature documenting the

negative effects of conflict avoidance on family functioning (Schrodt, 2005, 2009), yet contradict other studies indicating a protective effect of conflict avoidance on parental anti-substance-use injunctive norms. A recent study of Shin and Miller-Day (2017) revealed that adolescents in high conflict avoidant families were more likely to perceive parental disapproval of substance use than those in low conflict avoidant families. However, this current study suggests that adolescents in high conflict avoidant families report more substance use than those in low conflict avoidant families. The influence of conflict avoidance remains unclear and thus, future research needs to further investigate the differential effects of conflict avoidance on adolescent substance use outcomes (e.g., norms, attitudes, intentions, and actual behaviors).

Drug Talk Styles and Family Communication Environments

Finally, we consider whether drug talk styles operate independently of FCE in answer to the third hypothesis. Findings show that in general there was a significant difference of adolescent lifetime substance use across the four drug talk styles, while controlling for FCE and gender. That is, the use of an ongoing indirect style maintained its effect (i.e., lesser use of alcohol, cigarette, marijuana, and chewing tobacco than the other drug talk styles) regardless of FCE. Future research needs to investigate if the PODT model's dimension of directness and indirectness generate differential effects over time and across the three dimensions of FCE. More efforts should be made to integrate the PODT model with other important family theories to broaden our understanding of parent-child communication and specifically parental anti-drug socialization processes.

Limitations and Conclusions

The present study is one of a few studies that ask younger adolescents about their perceptions of parents' drug talk styles related to their reports of lifetime substance use. Future research can benefit from collecting data both from parents and adolescents and

examining the dyadic perspectives of parent and adolescent reports to enhance our knowledge of how parent and adolescent communication takes place. In particular, remaining questions exist about the effects when parent and adolescent report the same style or different style and how the similarity or discrepancy between parent and adolescent perceptions of drug talk styles influence risky behaviors such as adolescent substance use.

Although the present study offers insight in parent-child communication about substances during early adolescence, it is not without limitations. In the current study, a single item measure using scenarios was used to identify adolescent perceptions of the four drug talk styles. Considering the statistical difficulty in testing and validating measurement of a single item with categorical response options, future researchers should put more efforts to develop a more solid and reliable instrument that enables to accurately measure four distinctive styles of parent-adolescent drug talk. Second, the study was unable to examine differences across maternal and paternal drug talk styles. It may be plausible to assume that the effects of drug talk styles vary depending on the parent conveying the messages. Future research should consider collecting youth reports of drug talk styles for mothers and fathers respectively, as well as gathering data on family structure (e.g., living with a single parent, two parents, or a legal guardian). Third, it must be carefully noted that the cross-sectional data cannot test true cause-effect relationships. Future research will benefit from longitudinal data that follows students from early adolescence, late adolescence, and into young adulthood to investigate the transitions of drug talk styles and its influences on substance use behaviors. Researchers collecting longitudinal data could empirically test our suspicion that parents tend to provide clear and direct messages early on in adolescence (e.g., 6th or 7th grade) offering information and clear parental expectations about substance use, but then by the 9th grade they transition into using more indirect styles; that is, offering hints and comments that serve to reinforce the earlier messages. This trajectory seems to be the case unless the adolescent

begins using substances by the 9th grade. We believe that if an adolescent begins experimentation and use by the 9th grade, this will then prompt an increase in direct parent-child communication about substances. It is difficult to make recommendations about the “best” approach to parental prevention efforts without a fuller understanding of the trajectory of these talks over time. Hence, we encourage future longitudinal research to test these suppositions. Lastly, a majority of the participants were European American. The findings of the present study are not generalizable to adolescents of diverse race and ethnicities. Future research should extend this line of research by recruiting more diverse population.

In summary, the present study provides important findings suggesting that parental anti-drug socialization does not take place in one universal communication way. Rather, it discovers that different types of parent-adolescent drug talks and family communication environments have differential associations with adolescent lifetime use of substances respectively. Family communication scholars should consider various communication strategies and specify recommendations for parent-adolescent drug talk styles in relation to their family communication environment when developing and implementing family-based interventions for youth substance use prevention.

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Table 1. Descriptive Means and ANCOVA Results for H1

Lifetime Alcohol Use		Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 701)					
Situated Direct (<i>N</i> = 94)	M = 4.64 (SD = 3.41)	_____			
Ongoing Direct (<i>N</i> = 115)	M = 5.10 (SD = 2.97)	.171	_____		
Situated Indirect (<i>N</i> = 251)	M = 3.81 (SD = 2.80)	.034*	.000***	_____	
Ongoing Indirect (<i>N</i> = 241)	M = 3.07 (SD = 2.63)	.000***	.000***	.005**	_____
Lifetime Cigarette Use		Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 706)					
Situated Direct (<i>N</i> = 94)	M = 3.14 (SD = 3.56)	_____			
Ongoing Direct (<i>N</i> = 117)	M = 4.35 (SD = 3.68)	.002**	_____		
Situated Indirect (<i>N</i> = 253)	M = 2.33 (SD = 2.56)	.017*	.000***	_____	
Ongoing Indirect (<i>N</i> = 242)	M = 1.92 (SD = 2.18)	.000***	.000***	.100	_____
Lifetime Marijuana Use		Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 703)					
Situated Direct (<i>N</i> = 93)	M = 1.71 (SD = 1.70)	_____			
Ongoing Direct (<i>N</i> = 116)	M = 2.25 (SD = 2.05)	.004**	_____		
Situated Indirect (<i>N</i> = 252)	M = 1.46 (SD = 1.34)	.217	.000***	_____	
Ongoing Indirect (<i>N</i> = 242)	M = 1.22 (SD = .88)	.010*	.000***	.063 ⁺	_____
Lifetime Chewing Tobacco Use		Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 706)					
Situated Direct (<i>N</i> = 94)	M = 2.50 (SD = 2.54)	_____			
Ongoing Direct (<i>N</i> = 117)	M = 2.28 (SD = 2.26)	.912	_____		
Situated Indirect (<i>N</i> = 253)	M = 1.78 (SD = 1.97)	.032*	.029*	_____	
Ongoing Indirect (<i>N</i> = 242)	M = 1.60 (SD = 1.75)	.006**	.005**	.404	_____

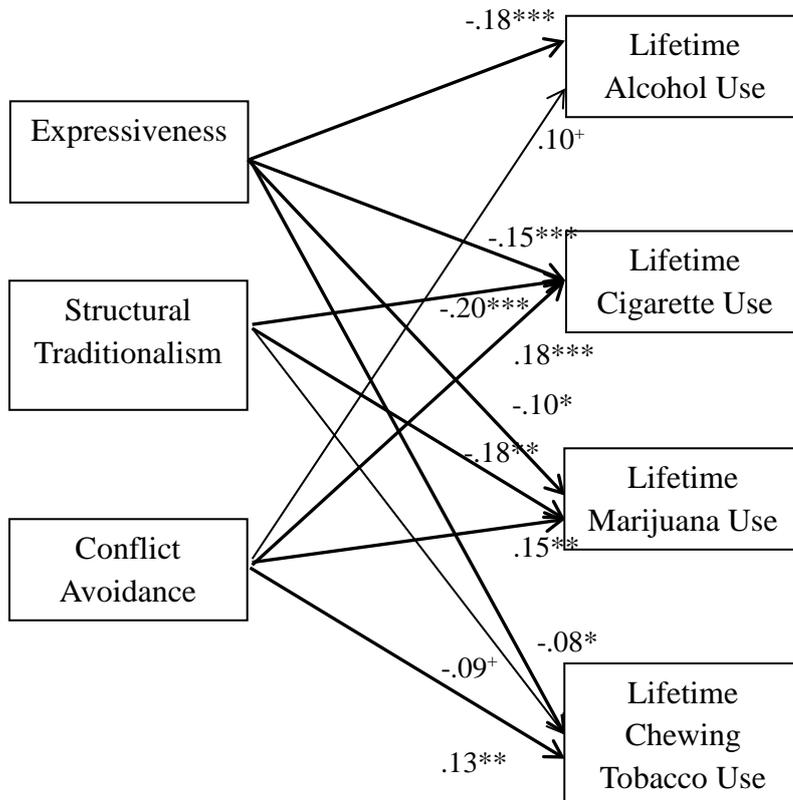
Note. ANCOVA Fisher's Least Significant Difference (LSD) post hoc analysis results. $p = .06^+$; $p < .05^*$; $p < .01^{**}$; $p < .001^{***}$

Table 2. Descriptive Means and ANCOVA Results for H2

Lifetime Alcohol Use			Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 674)						
Situated Direct	M = 4.65		_____			
(<i>N</i> = 92)	(SD = 3.43)					
Ongoing Direct	M = 5.10	.429		_____		
(<i>N</i> = 110)	(SD = 2.96)					
Situated Indirect	M = 3.79	.049*	.002**		_____	
(<i>N</i> = 241)	(SD = 2.76)					
Ongoing Indirect	M = 3.07	.000***	.000***	.016*		_____
(<i>N</i> = 231)	(SD = 2.62)					
Lifetime Cigarette Use			Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 678)						
Situated Direct	M = 3.18		_____			
(<i>N</i> = 92)	(SD = 3.59)					
Ongoing Direct	M = 4.30	.010*		_____		
(<i>N</i> = 112)	(SD = 3.70)					
Situated Indirect	M = 2.27	.029*	.000***		_____	
(<i>N</i> = 243)	(SD = 2.47)					
Ongoing Indirect	M = 1.90	.005**	.000***	.334		_____
(<i>N</i> = 231)	(SD = 2.17)					
Lifetime Marijuana Use			Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 675)						
Situated Direct	M = 1.73		_____			
(<i>N</i> = 91)	(SD = 1.72)					
Ongoing Direct	M = 2.22	.012*		_____		
(<i>N</i> = 111)	(SD = 2.02)					
Situated Indirect	M = 1.44	.304	.000***		_____	
(<i>N</i> = 242)	(SD = 1.28)					
Ongoing Indirect	M = 1.22	.057 ⁺	.000***	.216		_____
(<i>N</i> = 231)	(SD = .88)					
Lifetime Chewing Tobacco Use			Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect
Total (<i>N</i> = 678)						
Situated Direct	M = 2.53		_____			
(<i>N</i> = 92)	(SD = 2.56)					
Ongoing Direct	M = 2.33	.843		_____		
(<i>N</i> = 112)	(SD = 2.30)					
Situated Indirect	M = 1.79	.061 ⁺	.078		_____	
(<i>N</i> = 243)	(SD = 2.00)					
Ongoing Indirect	M = 1.61	.025*	.032*	.572		_____
(<i>N</i> = 231)	(SD = 1.77)					

Note. ANCOVA Fisher's Least Significant Difference (LSD) post hoc analysis results. $p = .06^+$; $p < .05^*$; $p < .01^{**}$; $p < .001^{***}$

Figure 1. Family Communication Environments and Adolescent Lifetime Substance Use



Note. Only significant paths are presented for the clarity. $p = .06^+$; $p < .05^*$; $p < .01^{**}$; $p < .001^{***}$