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Trends of Parent-Adolescent Drug Talk Styles in Early Adolescence

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Abstract

The present study seeks to understand how parents as prevention agents approach substance use prevention messages during the period of early adolescence. Students ($N = 410$) in a drug prevention trial completed surveys from 7th to 9th grade. Using longitudinal data, a series of latent transition analyses were conducted to identify major trends of parent-adolescent drug talk styles (i.e., never talked, situated direct, ongoing direct, situated indirect, and ongoing indirect) in control and treatment conditions. Findings demonstrate a developmental trend in drug talk styles toward a situated style of talk as youth transitioned from 7th grade to 9th grade. Findings also show that even though the drug prevention trial did not specifically target parental communication, parents in the treatment condition provide more ongoing substance use prevention messages to their adolescent children than do parents in the control condition. The present study discusses relevant developmental issues, potential intervention effects, and future research directions for communication research in substance use prevention.

Keywords: drug talk styles, parent-child communication, latent transition analysis, youth substance use, substance specific prevention communication

Trends of Parent-Adolescent Drug Talk Styles in Early Adolescence

Adolescence is a time of many challenges, none potentially more significant than decisions to participate in risky behaviors such as alcohol, tobacco, and other drug use. Substance use in adolescence increases health risks that can be extremely costly to society (American Cancer Society, 2017). As adolescents gain independence they have more freedom to make personal choices that could potentially impact health and well-being, with current trends suggesting a shift in early adolescence from anti-substance attitudes and norms to more pro-substance attitudes and norms (Wong et al., 2006) and then to early experimentation (Griffin, Scheier, Botvin, & Diaz, 2000). According to the *Monitoring the Future national survey* (Miech, Johnston, O'Malley, Bachman, & Schulenberg, 2015), the percentage of adolescents' substance use increases approximately threefold between the ages of 13 and 17, rising from 10% to 35% for alcohol and from 4% to 11% for smoking. The report also reveals that high levels of alcohol consumption co-occur with tobacco and other illicit drug use. Given that substance use is typically adopted before adulthood, adolescence represents a priority target group for preventive action (Choi, Krieger, & Hecht, 2013; Hargreaves, McVey, Nairn, & Viner, 2013). This need for prevention with early adolescent populations presents a challenge to health communication theory, research, and practice.

Many preventive interventions and media campaigns attempt to delay and deter adolescent substance use by encouraging parents to talk with their adolescents about substances as well as increasing the level of overall parent-adolescent communication (Madras, 2010). Evidence shows that such interventions can significantly buffer against the risks of early initiation (Substance Abuse and Mental Health Services Administration, 2013). The National Institute on Drug Abuse (NIDA), for example, launched an online tool called *Family Checkup* for parents to use with their families in an effort to prevent drug abuse (see www.drugabuse.gov/family-checkup). This website highlights the preventative role parents-

adolescent communication can play. Despite the prescription for parents to talk with their

adolescents about substance use, scholars are just beginning to examine the variety of ways

parents approach their role as prevention agents during the critical developmental period of

early adolescence (Kam & Miller-Day, 2017; Pettigrew et al., 2018). Moreover, most of the

research in this area is cross-sectional and fails to capture any changes that occur across time

as youth develop from early to middle adolescence. The present study seeks to understand

how parents, as prevention agents, approach substance use prevention messages during this

transitional period starting in early adolescence.

Parent-Adolescent Communication about Substances

Research on family communication argues that many parents function as anti-

substance-use socialization agents by shaping youth's substance-related attitudes, norms,

intentions, and behaviors through direct and indirect prevention messages (Choi, Miller-Day,

et al., 2017; Pettigrew et al., 2018). Parents are the individuals with whom children are most

likely to talk about substances and many youths consider parents to be credible sources of

drug information (Kelly, Comello, & Hunn, 2001). Parent-adolescent communication plays a

particularly important role in substance use prevention due to its potential for effectively

buffering youth against the risks of early use initiation (Kosterman, Hawkins, Guo, Catalano,

& Abbott, 2000). Given this prominent position and potential preventative effect, scholars

have argued for the need to look more closely at substance-specific communication between

parents and adolescents (Miller-Day & Kam, 2010; Reimuller, Hussong, & Ennett, 2011).

Indeed, research has shown that substance specific communication more strongly relates to

youth outcomes, including anti-substance-use norms, negative attitudes toward substance use,

and reported behavior than general openness in parent-adolescent communication (Boone &

Lefkowitz, 2007; Kam & Middleton, 2013; Shin & Miller-Day, 2017). Knowing that

substance-specific communication is protective and identifying the characteristics of effective

substance-specific communication, however, are different questions.

To provide a more robust examination of parent-adolescent communication about substances, Miller-Day and her colleagues developed a line of research around characteristics of parental prevention messages and identified "drug talk" styles (Miller-Day & Dodd, 2004; Pettigrew et al., 2018) and examined the effects of parental substances specific prevention communication (SSPC) on youth outcomes (Choi, Miller-Day, et al., 2017; Kam, Basinger, & Abendschein, 2015; Pettigrew, Shin, Stein, & Raalte, 2017). While SSPC research that examines parental prevention messages has burgeoned in the past few years (Miller-Day, 2008; Miller-Day & Kam, 2010), there has been little research to-date that longitudinally examines parent-adolescent conversational styles; that is, how parents approach the topic of alcohol and other drugs with their adolescents across time as they age. One exception is a recent study that analyzes both general family communication environment and substance specific parental communication to identify parental prevention communication profiles such as passive-silent, active-silent, passive-open, and active-open profile (Choi, Miller-Day, et al., 2017). This study demonstrates that families do differ in their approaches to the issue of adolescent substance use and these approaches differentially affect adolescent substance use over time.

Furthermore, child development and family scholars claim that the protective potential for parental substance-specific communication is particularly salient during early adolescence (Oetting & Donnermeyer, 1998; Williams, Ayers, Baldwin, & Marsiglia, 2016). Parents are still important to youth during the developmental period of early adolescence. Although peer influences increasingly gain importance during this time, parental influence does not become weak (Kumpfer, Alvarado, & Whiteside, 2003; Nation et al., 2003). Yet, early adolescence represents a crucial time of substance use initiation (Spoth, Redmond, & Shin, 2001) and early initiation predicts later dependency (D'Amico, Ellickson, Collins,

Martino, & Klein, 2005; McCabe, West, Morales, Cranford, & Boyd, 2007). Moreover, once an adolescent has initiated substance use in adolescence, parental influence seems to decrease (Koning et al., 2009; Van der Vorst, Engels, Meeus, & Deković, 2006). This finding suggests that the window of opportunity for parent-adolescent conversations to prevent the onset of substance use may begin to shrink as youth age. Thus, early prevention efforts are needed to reduce the potentially high social, emotional, and public health costs related to adolescence substance use. The present study acknowledges the importance of considering child development in research design and examines the longitudinal trends of drug talk styles as youth transition from early to middle adolescence. We now turn our attention to literature on a model of drug talk styles.

Drug talk styles. Miller-Day and Dodd (2004), in their pivotal study of incoming college freshmen, presented a model of Parent-Offspring Drug Talks. The model drew on descriptive, narrative research framed by social control theory to examine who participated in substance use prevention conversations, when and where they took place, and what was discussed. The study illustrated two approaches to parental prevention communication, labeled as parental anti-drug socialization: (1) integrated socialization and (2) targeted socialization. Integrated socialization efforts involve a series of ongoing comments and casual discourse about drugs or drug use "integrated into the fabric of the family's everyday life throughout the child's development" (Miller-Day & Dodd, 2004, p.84). Integrated approaches reflect parents who are *ongoing agents* of socialization throughout a child's development. Targeted socialization efforts refer to messages limited to a particular point or few points in time during the offspring's development. Their research also discovered differences in the degree of directness in conversations (i.e., if talks discussed drugs implicitly or explicitly).

Based on these descriptive findings, Miller-Day and Dodd (2004) presented a

typology of four (preventive) drug talk styles varying along two dimensions: timing and directness. The timing dimension reflects ongoing/situated messages whereas the directness dimension reflects direct/indirect messages (Pettigrew et al., 2018). These combine to identify four styles. A *situated direct* style of drug talks most closely resembles a "sit-down let's have a talk" one-shot discussion advocated in media campaigns and the direct messages may include "rules, behaviors, attitudes, or expectations about drugs and drug use" (Miller-Day & Dodd, 2004, p. 83). This communication tends to be situational and either reactive—prompted by an event such as the child coming home drunk—or proactive—in preparation for an event such discussing rules about drinking and driving prior to the youth receiving his/her driver's license. This contrasts with a *situated indirect* style that is also situational but characterized by nonverbal messages or subtle verbal hints alluding to disapproval of substance use, rather than explicitly commenting on drugs and drug use. The *ongoing direct* style of drug talk is characterized by openness and directness, repeating anti-drug use messages during everyday life, such as frequently reinforcing rules, articulating expectations, or merely commenting on television character's substance use. On the other hand, an *ongoing indirect* style of approaching drug talks is described as providing a variety of verbal hints and nonverbal messages over time that suggest—but do not directly articulate—anti-drug use norms. For example, a parent who abstains from drinking alcohol or smoking tobacco may demonstrate rather than explicitly state anti-use attitudes and norms. Lastly, the final drug talk style is to *never provide prevention messages*. Parents who never talk explicitly with their adolescents about substances or substance use may very well be sending implicit messages that inadvertently promote substance use (Reimuller et al., 2011).

This typology of styles provides a useful roadmap for assessing parents' general approach to their role as prevention agents, but these styles remain descriptive in nature and have heretofore only been applied to young adults. The current study is the first to examine

adolescents' perceptions of parental (preventive) drug talk styles during adolescence and assess if these perceptions of parental styles change over time. Toward that end we pose the following research question:

RQ1: Do parent-adolescent drug talk styles change over time as youth move through early adolescence?

Additionally, there are few studies that examine the potential effects of a universal school-based substance use prevention program (even one that contains no parent involvement or parent-related content) on communication about substances in the home. It is possible that that when a child is exposed to a universal substance use prevention program in school, this exposure might prime parent-adolescent communication about substance use and abuse at home. Narrative Engagement Theory (NET) (Larkey & Hecht, 2010; Miller-Day & Hecht, 2013) specifically predicts that effective narrative-based health promotion programs will socially proliferate. They argue that narratives are engaging and that engaging prevention messages will be discussed with others in the social network, including parents. Thus, we would expect a successful narrative-based drug prevention curriculum to be discussed outside the intervention context.

Targeting adolescents, the middle school keepin' it REAL (kiR) school-based program is a narrative-based communication intervention designed to reduce adolescent substance use. Previous research suggests that almost all youth exposed to the kiR program discuss the curriculum in a positive way in their peer networks (Choi, Hecht, & Smith, 2017). Considering parents as the most common target for drug talks (Choi, Miller-Day, et al., 2017; Kelly et al., 2001), we examine the potential intervention effects on drug talks by posing a second research question:

RQ2: Does participation in a universal school-based substance use prevention program (kiR) influence parent-adolescent drug talk trajectories when compared

to students not receiving the program?

Methods

Procedures and Participants

As part of a larger study investigating curriculum adaptation (see Colby et al., 2013) and implementation processes (Pettigrew et al., 2015) of the school-based *keepin' it REAL* (kiR) drug prevention curriculum, self-report surveys were administered during school hours to students in both the treatment condition (those students receiving the kiR curriculum) and the control condition (those students not receiving the kiR curriculum but receiving the standard school curriculum). Data were collected between 2009 and 2012 over four waves, starting in the fall of 7th grade (2009) (W1) before the intervention, and subsequently immediately following the intervention during spring of 7th (W2), and in annual intervals at the end of spring in 8th (W3) and 9th (W4) grades. Prior to the data collection, passive informed consent was obtained from parents and assent obtained from participating students. The university institutional review board approved all procedures.

Participants in the survey attended rural school districts in 39 schools across two Midwestern states. The sample at Wave 1 ($n = 463$) was 53% female and ranged in age from 11 to 14 years ($M = 12.3$ years, $SD = 0.51$). Participants were 92% White (Anglo), 3% African American (Black), 2% Hispanic, and less than 1% Asian or Pacific Islander, which matched demographics for the rural areas of Pennsylvania and Ohio where the study took place (Graham et al., 2014).

The *keepin' it REAL* (kiR) curriculum is a 10 lesson 7th grade drug prevention program that successfully reduced alcohol, tobacco, and marijuana use at the 14-month follow up in a previous group randomized trial (Hecht et al., 2006). The program promotes anti-drug norms, teaches drug offer refusal skills, risk assessment, and decision making, and motivates youth to competently utilize communication skills in drug offer situations (Elek,

Wagstaff, & Hecht, 2010; Hecht, Graham, & Elek, 2006; Miller-Day & Hecht, 2013). kiR is believed to be the most widely implemented drug prevention curriculum, reaching almost 1 million youth in the U.S. as well as those in 52 countries around the world. It was recently recommended for dissemination in the Surgeon General's report on addiction (Murthy, 2017). Thus, it is important to understand any potential "spill over" effects such as social proliferation in parent-child communication.

The 39 participating schools were randomly assigned (see Graham et al., 2014) to a control condition ($n = 14$) or one of two treatment conditions. The first treatment condition included schools that received the original version (Gosin, Marsiglia, & Hecht, 2003; Hecht et al., 2006) of the curriculum ($n = 11$) and schools in the other condition received a version customized (Colby et al., 2013) to the rural context ($n = 14$). Neither the original nor customized versions of the kiR curriculum content addresses parental communication about substances or substance use, nor are there curriculum activities that target parents or involve them in direct prevention activities. Because neither version of the curriculum incorporated content related to parental communication, data from these schools were aggregated for all analyses. There were a total 463 completed responses for all four waves of data on the parent-adolescent drug talk measure. Of these responses, 53 students appeared to be outliers, reporting movement from receiving anti-use messages at one wave and then reporting "never talked" at a later wave. Due to the impossibility of talks moving in this direction, these responses were deemed inaccurate and these respondents were removed from the sample. Removing these left a final sample of 410 cases that were used for latent transition analyses.

Measures

Based on Miller-Day and Dodd's model of Parent-Offspring Drug Talks (2004), scenarios were created to illustrate each of the drug talk styles. For each drug scenario students were asked, "Please indicate which of the following scenarios most resembles how

your parent has talked with you about alcohol, tobacco, or other drug use." and responded to one of the following categories: (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*), (5) "My parent(s) never talked with me about alcohol and other drugs," ("*never talk*") and (6) "other (please specify)." The "other" category provided an open-ended response option for those who did not find the matching response from the categories listed. For the current paper, "other" option was excluded from analysis. Table 1 presents the frequency of the reported drug talk styles at each wave of data collection for the control condition and the treatment condition.

Analysis Summary

Using Mplus (Muthén & Muthén, 2015), a series of latent transition analyses (LTAs) was run to examine if participants changed drug talk response patterns over four waves of data collection (from 7th grade to 9th grade) (RQ1). To address our second research question (RQ2), two sets of latent transition analyses were run to examine changes of drug talk styles over time in two conditions: control condition (*n* = 144) and treatment condition (*n* = 266).

Latent transition analysis is a longitudinal extension of latent class analysis (LCA), which identifies patterns of responses based on similar characteristics of individual responses (Bray, Lanza, & Collins, 2010; Collins & Lanza, 2010). LCA is conceptually like cluster analysis but differs in statistical approach. Whereas cluster analysis only explores group

memberships, LCA identifies latent classes by comparing the fitness of model indices and estimates the conditional probability of each participant in each latent class. Furthermore, extension to LTA enables researchers to examine the trajectories of an individual's latent class membership over time. Model comparisons are commonly used to test the fitness of LCA based on the model fit criteria. Smaller values of Akaike's Information Criterion (AIC) and the Bayesian Information Criterion (BIC) as well as higher entropy value and interpretability of results are key determinants for the optimal model fitness (Collins &Lanza, 2010). In this study, each response category of drug talk was treated as a latent class. That is, we did not test a one class model iteratively against additional class models but rather forced the model to have five classes defined by the five response options. In this respect, model fit criteria were not applicable to confirm the number of class memberships of each wave.

We argue that this approach, despite the limitation of not comparing model indices, is the best because it most closely accords to the data (i.e., there were five response options available to participants at each wave, thereby allowing us to track transition probabilities in responses from wave to wave). Further, we judge LTA to be the most appropriate analytical approach because it provides probabilities for a participant to transition from one specific response option to another over time compared to simply examining changes of descriptive statistics of each wave. That is, LTA provides statistics that indicate the likelihood of individuals' response trajectories across four waves, whereas descriptive data only presents a general sense of the aggregate proportion in each response.

For the present study, five response categories were included to identify the transitions of five latent classes (i.e., situated direct style, ongoing direct style, situated indirect style, ongoing indirect style, and never talked). A transition probability of 1 represents a 100 percent likelihood of a class membership transition from one wave to another wave. Using maximum rule assignment (Nagin, 2005), the highest conditional

probability of each class was interpreted. In this study, probabilities greater than 70% were presented as major transitions and those over 50% were reported as moderate transitions.

Results

Two research questions were posited to examine the latent transitions of parent-adolescent drug talk styles over time. The analyses revealed that drug talk styles changed over time as the youth transitioned from 7th grade to 9th grade (RQ1) and the transitions differed between youth in the control condition and those in the treatment condition (RQ2). We start by presenting major and moderate transitions in the control group and then present results for the treatment group. Finally, we compare transition patterns between the two conditions.

Control Condition Transitions

Estimates of the transition probabilities of membership between each wave in the control condition (i.e., W1 → W2, W2 → W3, and W3 → W4) demonstrate three patterns of change over time (see Table 2 and Figure 1). The first transitional pattern came from W1 Situated Direct and Situated Indirect to W2 Situated Direct to W3 Situated Indirect followed to W4 Ongoing Indirect. That is, at the beginning of 7th grade, students reported parents talked directly or indirectly hinted about substance use on one or two specific occasions. But by the end of 7th grade, students reported that parents increased direct communication about substances and substance use. By the end of 7th grade, parents were no longer hinting, but directly addressing the topic with their child on one or two specific occasions. Yet, at the end of 8th grade, students reported parents resumed hinting about substance use on a few occasions, but at the end of 9th grade, students reported parents' continued indirectness and hinting, but these messages occurred with increased frequency.

A second pattern was from W1 Ongoing Direct to W2 Ongoing Indirect to W3 Situated Direct to W4 Situated Indirect. That is, at the beginning of 7th grade, students

reported parents' frequent direct talk about substance use. But by the end of 7th grade, students reported that parents maintained frequency, but reverted to indirectly hinting about the topic. At the end of 8th grade, students reported parents resumed direct messages, but frequency was restricted to 1-2 occasions. Finally, at the end of 9th grade, students reported parents' decreased frequency and directness in their communication about substance use to hinting on 1-2 occasions.

Finally, a third pattern emerged from transitions that described movement from W1 Never Talked to W2 Never Talked to W3 Situated Indirect to W4 Ongoing Indirect. That is, during the entirety of 7th grade, students reported parents never communicating with them about substances or substance use, but by the end of 8th grade, parents indirectly hinted about substance use on one or two specific occasions. Finally, at the end of ninth grade, parents increased their frequency of communication, but continued to be indirect. These patterns are summarized in Figure 1 leading to the main conclusion that overall class membership among control group members was not stable over time. In other words, youth were less likely to report the same parent-adolescent drug talk style over time. Across all patterns, conversations transitioned in general toward less ongoing and more situated and from more direct to more indirect drug talks. Finally, there was a slight movement out of the "never talked" style.

Treatment Condition Transitions

Estimates of the transition probabilities of membership between each wave in the treatment condition present a complex picture, also reflecting three patterns (see Table 3 and Figure 2). The first major pattern transitioned from W1 Situated Direct and Situated Indirect to W2 Situated Direct to W3 Ongoing Direct to W4 Ongoing Indirect. That is, at the beginning of 7th grade, students reported parents either talked directly or indirectly hinted about substance use on one or two specific occasions. But by the end of 7th grade, students reported parents no longer resorting to hints but directly addressing the topic with their child

on one or two specific occasions. By the end of 8th grade, students reported that parents increased the frequency of their direct communication about substance use. Finally, by the end of 9th grade parents maintained frequency of their messages, but became less direct and relied on hints.

The second pattern, originated in W1 Ongoing Direct and transitioned to W2 Ongoing Indirect to W3 Ongoing Indirect. This pattern did not show a clear transition from W3 Ongoing Indirect to W4 drug talk style. That is, at the beginning of 7th grade, students reported parents were already frequently talking with them directly about substance use. By the end of 7th grade and sustained through 8th grade parents reduced directness, but frequently provided hints. No significant pattern of change occurred in this group as they moved into 9th grade. Finally, the third pattern demonstrated transitions from W1 Never Talked to W2 Never to W3 Situated Direct to W4 Ongoing Direct. That is, during the entirety of 7th grade, students reported parents never communicating with them about substances or substance use, but by the end of 8th grade, parents had directly talked about substance use on one or two specific occasions. Continuing in directness and increasing in frequency by the end of ninth grade, parents frequently and directly talked with students about substance use.

There also were a series of transitions that involved only two or three waves but do not radiate through the entire time period. For treatment participants, most of the styles remained stable during the first transition (W1 $\rightarrow$ W2) but later transitioned to different styles (W2 $\rightarrow$ W3 and W3 $\rightarrow$ W4). As summarized in Figure 2, overall, the main finding is that treatment group participants tended to transition out of the "never talked" class and regardless of where they started were most likely to move to more direct and ongoing styles.

Comparison of Control and Treatment Condition Transitions

We address the second research question by comparing major transitions across four waves between control and treatment conditions. The main difference was from W1 Ongoing

Direct. For the control group, this drug talk style transitioned to W2 Ongoing Indirect whereas the treatment group was more likely to stay in the same style of W2 Ongoing Direct. That is, throughout the year students were in the 7th grade and receiving the 10-week substance use intervention, parents sustained frequent and direct communication about substance use; whereas, parents of youth not receiving the intervention became more indirect in their communication, providing frequent reminders and hints about substance use rather than directly addressing the topic.

In summary, the main differences occurred in transitions between W2 and W4, particularly at W3—by the end of 8th grade. For youth in the control condition there was a clear progression to direct conversations between W2 (end of 7th grade) and W3 (end of 8th grade) and a move toward indirect conversations as they moved to W4 (end of 9th grade). Youth in the treatment condition, however, manifested a different pattern. Their transitions between W2→W3 and W3→W4 were predominately marked by a move from indirect to direct and from situated to ongoing. The main pattern was as follows: Never talked moved to the situated direct style (96% probability from W2 to W3 and 84% probability from W3 to W4); situated indirect moved to situated direct (71% probability from W2 to W3 and 74% probability from W3 to W4); and, situated direct moved to ongoing direct (96% probability from W2 to W3 and 84% probability from W3 to W4). Overall, the typical trajectory for parents of youth in the control condition was to have "the talk" and then subsequently de-escalate; that is, then decrease directness and/or frequency of communication about substance use. However, for youth receiving the substance use prevention intervention, parents tended to increase or sustain frequency and directness of communication about substance use.

Discussion

Findings from this study depicts and describes changes in parent-adolescent drug talk styles from the beginning of 7th grade to the end of 9th grade. Findings suggest a changing

trend in drug talk styles during this developmental period. Additionally, observed differences between youth in control and treatment conditions suggests a potentially unintended effect of school-based substance use prevention intervention efforts on parent-adolescent communication in the home. We discuss relevant developmental issues, potential intervention effects, and suggest future research directions in the context of this study's strengths and weaknesses.

Overall trends: Developmental issues

Developmentally, the transition from W2 (end of 7th grade) to W3 (end of 8th grade) seems to be the crucial period (See Figure 1 and 2) for parent-adolescent communication about substance use. The most movement was discovered during this transition, regardless of intervention condition. The major trend was for this development period was for parents to never talk about substance use with their child to addressing it either directly or indirectly by the end of 8th grade. This increased attention to addressing substance use with youth is promising given the importance of parent-child communication during this crucial period. While one would hope for frequent drug talks earlier than 8th grade, at least it appears that parents and youth naturally come to discuss substances during a period of potentially escalating risk. These changes may indicate that parents of youth in the rural schools in our sample viewed this transition as an appropriate time to find situations to specifically address drug use in the lives of their adolescents.

In addition, the major trend toward infrequent, situated direct and indirect styles was also found in both conditions from W2 to W3. This trend, as youth transitioned from 7th grade to 8th grade, may be explained by adolescents' greater exposure to substances as they get older, necessitating ongoing parental intervention. According to national surveys (Substance Abuse and Mental Health Services Administration, 2013), drug use increases steadily as youth progress through adolescence and parents seem intuitively aware of this

transition. The rural geographic location may provide another explanation for increased attention to communicating about substance use. Evidence shows that rural youth reported higher rates of past year use of alcohol and other illicit drugs (Lambert, Gale, & Hartley, 2008) and higher prevalence of past month of tobacco and alcohol use than urban youth (Gfroerer, Larson, & Colliver, 2007). It is plausible to assume that parents living in rural areas may consider their geographic location an additional risk factor for their adolescent and initiate drug talks as a tool for prevention or the drug talk might be in reaction to an adolescents' actual use of a substance.

Potential intervention effects

Important differences in parent-adolescent drug talks were observed for those students who received the school-based substance use prevention intervention (treatment condition) and those who did not (control condition). While both groups reported that their parents addressed the topic of substance use more frequently or directly between 7th and 8th grades, parents of adolescents receiving the intervention were more likely to use more frequent and direct styles during the year of the intervention (W1→W2) and this differential trend continues in later years.

For those youth not receiving the school-based intervention, once parents had "the talk" with their adolescent, they appeared to be satisfied and de-escalate their efforts, thereafter relying on indirect messages (See Figure 1). Perhaps the 9th grade talks were perceived as reminder or maintenance messages, merely reinforcing the direct messages previously shared. In any case, these conversations became less direct and were less likely to be frequent or ongoing. On the other hand, our analysis indicates that in the treatment condition, not only were more of the immediate conversations direct in style but over time they became increasingly direct and frequent (See Figure 2). Thus, treatment conversations steadily moved toward being direct and frequent while control conversations moved toward

infrequent direct conversations initially, but then settled into an approach that was indirect.

A second major difference between groups is the frequency of parental use of the "never talked" style. Over time, treatment participants were significantly less likely than control participants to report their parents "never talked" to them about substance use. It appears that when youth participate in a school-based substance use prevention program such as kiR, parent-adolescent communication about drugs is more likely to occur even if the curriculum does not directly address call for this communication.

Differential patterns between the treatment and control conditions suggest additional intervention effects of the *keepin' it REAL* program. Overall, parents of youth who receive the program are more likely to have direct and frequent talks about substance use. This is potentially important since Miller-Day and Dodd (2004) claim that ongoing, frequent and direct talks are the most effective style over time because they effectively reinforce anti-drug norms and attitudes. This interaction between school and home also accords with Bronfrenbrenner and Morris' (2006) description of the mesosystem within an ecological theory of family development. In this theory, elements in a family's microsystem (e.g., school, peers, and family members) mutually influence one another, which would explain how a school-based intervention without parent-adolescent communication content would impact family processes. Finally, the finding also aligns with previous research on substance-specific communication. Pettigrew et al. (2018) demonstrated that external experiences within a family's ecological environment—including school-based prevention programing— have "triggered" drug talks between parents and youth, particularly encouraging an ongoing direct style of communicating about substance use. It is possible that knowing a child is receiving a substance use prevention curriculum in school and/or the child discussing the program at home may heighten parents' awareness of substances and substance use in their

adolescents' lives. Either or both of these processes may have prompted parents to be more direct in their prevention messaging following the 7th grade curriculum.

Limitations and directions for future research

Although the present study provides significant implications, it is not without limitations. First, this study uses a single scenario to represent each drug talk style of parent-adolescent communication. In other words, even though they had 6 possible choices for each scenario (one for each of the four styles, "never talk", other), we presented only one situation for each style to predict class membership. Therefore, we could not run a latent profile analysis to confirm the number of latent classes and to test the model fit indices. Additional indicators will, potentially, add capability to statically test and confirm a latent profile analysis and a latent transition analysis.

Second, the results of latent transition analyses predicted the latent transition probabilities among four styles and "never talked" over four waves. Conceptually, any transition from one of the four drug talk styles to "never talked" did not make sense because adolescent responses reporting one of the four styles at the base wave and "never talked" at later waves (e.g., wave 2, 3, and 4) were removed for the analyses. However, latent transition analyses did yield estimates of transitional probabilities from one of the four styles to "never talked" over time. According to Collins and Lanza (2010), latent transition probabilities are estimated based on latent class prevalence, incidences of transitions between latent classes, and adjustment of measurement error. In this respect, we found a discrepancy between conceptual expectations (i.e., that they could not transition from having talked using one of the style to saying they never talked) and statistical results. Nonetheless, the study's findings are noteworthy since it is the first study to take the person-centered approach to examine individuals' changes of drug talk styles over time.

Third, we acknowledge the importance of providing a time frame for adolescents to reflect their drug talk styles with parents in future research. The present study used a single item asking if they have ever engaged in one of parent-adolescent drug talk styles. Designating a certain time frame to reflect drug talk styles (e.g., past 6 months) may help adolescents more accurately report their drug talk style. It is also recommended that scholars further explore how youth evaluate drug talks. Each style can result in positive and negative experiences and youth's perceptions of styles may reinforce or diminish the effects of the messages. For example, adolescents who have positive associations or are satisfied with their parent's style may have better outcomes than those youths who have negative associations or who are dissatisfied. Not only is it important to understand parental styles of approaching their role as prevention agents, but it is also imperative to understand youth evaluations of these styles.

Lastly, although the present study provides insightful descriptions of longitudinal transitions of drug talk styles over time, these transitions are not linked to youth outcomes in this study. Considering previous literature on targeted parent-adolescent communication about alcohol predicting youth alcohol and other drug use (Kam & Middleton, 2013; Shin & Hecht, 2013; Shin, Lee, Lu, & Hecht, 2016), future research should further investigate the effects of different drug talk styles on youth attitudes and behaviors.

In conclusion, the present study examines the longitudinal transitions of parent-adolescent drug talk styles over time and further compares if those changes differ in youth with/without the school-based intervention. Based on the latent transition analyses, the findings suggest that these conversations showed increasing likelihood of occurring during the critical transition from 7th to 8th grades and generally moved toward a more direct style of drug talk during this crucial period. The trend toward directness was maintained by parents of youth in the treatment group as the adolescents transitioned into high school and further

became part of their ongoing conversations rather than situated conversations. However, the trend for parents of youth in the control group was to move toward more indirect and situated messages as they move toward high school perhaps leaving their youth vulnerable to increasing pressure to use combined with availability. Intervention effects of school-based prevention programs on family communication should be explored in future research, even in programs that do not directly address parent-adolescent communication.

References

American Cancer Society (2017). *Alcohol use and cancer*. Retrieved from

https://www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-

cancer.html

Boone, T. L., & Lefkowitz, E. S. (2007). Mother-adolescent health communication: Are all

conversations created equally? *Journal of Youth and Adolescence*, *36*, 1038-1047.

doi: 10.1007/s10964-006-9138-2

Bowen, M. (1978). *Family therapy in clinical practice*. New York, NY: Jason Aronson.

Bray, B. C., Lanza, S. T., & Collins, L. M. (2010). Modeling relations among discrete

developmental processes: A general approach to associative latent transition analysis.

Structural Equation Modeling, *17*, 541-569. doi: 10.1080/10705511.2010.510043

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human

development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology*

(6th ed., pp. 793-828). Hoboken, NJ: Wiley.

Choi, H. J., Hecht, M. L., & Smith, R. A. (2017). Investigating the potential impact of social

talk on prevention through social networks: The relationships between social talk and

refusal self-efficacy and norms. *Prevention Science, 18*, 459-468.

doi:10.1007/s11121-017-0764-6

Choi, H. J., Krieger, J. L., & Hecht, M. L. (2013). Reconceptualizing efficacy in substance

use prevention research: Refusal response efficacy and drug resistance self-efficacy in

adolescent substance use. *Health Communication*, *28*, 40-52.

doi:10.1080/10410236.2012.720245

Choi, H. J., Miller-Day, M., Shin, Y., Hecht, M. L., Pettigrew, J., Krieger, J. L., & Graham, J.

W. (2017). Parent prevention communication profiles and adolescent substance use:

A latent profile analysis and growth mixture model. *Journal of Family*

Communication, *17*, 15-32. doi.org/10.1080/15267431.2016.1251920

Colby, M., Hecht, M. L., Miller-Day, M. L., Krieger, J. L., Syvertsen, A. K., Graham, J. W., & Pettigrew, J. (2013). Adapting school-based substance use prevention curriculum through cultural grounding: A review and exemplar of adaptation processes for rural schools. *American Journal of Community Psychology*, *51*, 190-205. doi: 10.1007/s10464-012-9524-8

Collins, L. M., & Lanza, S. T. (2010). *Latent class and latent transition analysis with applications in the social, behavioral, and health sciences*. Hoboken, NJ: Wiley.

D'Amico, E. J., Ellickson, P. L., Collins, R. L., Martino, S., & Klein, D. J. (2005). Processes linking adolescent problems to substance-use problems in late young adulthood. *Journal of Studies on Alcohol*, *66*, 766-775. doi: 10.15288/jsa.2005.66.766

Elek, E., Wagstaff, D. A., & Hecht, M. L. (2010). Effects of the 5th and 7th grade enhanced versions of the *keepin' it REAL* substance use prevention curriculum. *Journal of Drug Education*, *40*, 61-79. doi:10.2190/DE.40.1.e

Gfroerer, J. C., Larson, S. L., & Colliver, J. D. (2007). Drug use patterns and trends in rural communities. *The Journal of Rural Health*, *23*, 10-15. doi:10.1111/j.1748-0361.2007.00118.x

Gosin, M., Marsiglia, F. F., & Hecht, M. L. (2003). *keepin' it REAL*: A drug resistance curriculum tailored to the strengths and needs of pre-adolescents of the southwest. *Journal of Drug Education*, *33*, 119-142. doi:10.1080/10810730903528017

Graham, J. W., Pettigrew, J., Miller-Day, M., Krieger, J. L., Zhou, J. & Hecht, M. L. (2014). Random assignment of schools to groups in the drug resistance strategies rural project: Some new methodological twists. *Prevention Science*, *15*, 516-525. doi:10.1007/s11121013-0403-9

Griffin, K. W., Scheier, L. M., Botvin, G. J., & Diaz, T. (2000). Ethnic and gender

differences in psychosocial risk, protection, and adolescent alcohol use. *Prevention Science*, *1*, 199-212. doi:10.1023/A:1026599112279

Hargreaves, D. S., McVey, D., Nairn, A., & Viner, R. M. (2013). Relative importance of individual and social factors in improving adolescent health. *Perspectives in Public Health*, *133*, 122-131. doi:10.1177/1757913912472417

Hecht, M. L., Graham, J. W. & Elek, E. (2006). The drug resistance strategies intervention: Program effects on substance use. *Health Communication*, *20*, 267-276. doi:10.1207/s15327027hc2003_6

Kam, J. A., Basinger, E. D., & Abendschein, B. (2015). Do adolescent perceptions of parents' alcohol consumption undermine or enhance what parents say about alcohol? The interaction between verbal and nonverbal messages. *Communication Research, 44*, 319-347. doi:10.1177/0093650214565922

Kam, J. A., & Middleton, A. V. (2013). The associations between parents' references to their own past substance use and youth's substance use beliefs and behaviors: A comparison of Latino and European American youth. *Human Communication Research*, *39*, 208-229. doi:10.1111/hcre.12001

Kam, J. A., & Miller-Day, M. (2017). Introduction to special issue. *Journal of Family Communication*, *17*, 1-14. doi: org/10.1080/15267431.2016.1251922

Kelly, K. J., Comello, M. L., & Hunn, L. C. (2001). Parent-child communication, perceived sanctions against drug use, and youth drug involvement. *Adolescence*, *37*, 775-787.

Koning, I. M., Vollebergh, W. A., Smit, F., Verdurmen, J. E., Van Den Eijnden, R. J., Ter Bogt, T. F., . . . Engels, R. C. (2009). Preventing heavy alcohol use in adolescents (PAS): Cluster randomized trial of a parent and student intervention offered separately and simultaneously. *Addiction*, *104*, 1669-1678. doi:10.1111/j.1360-0443.2009.02677.x

Kosterman, R., Hawkins, J., Guo, J., Catalano, R., & Abbott, R. (2000). The dynamics of alcohol and marijuana initiation: Patterns and predictors of first use in adolescence. *American Journal of Public Health*, *90*, 360–366. doi:10.1111/hcre.12001

Kumpfer, K. L, Alvarado, R., & Whiteside, H. O. (2003). Family-based interventions for substance use and misuse prevention. *Substance Use & Misuse*, *38*, 1759-1787. doi: 10.1081/JA-120024240

Lambert, D., Gale, J. A., & Hartley, D. (2008). Substance abuse by youth and young adults in rural America. *The Journal of Rural Health*, *24*, 221-228. doi: 10.1111/j.1748- 0361.2008.00162.x

Larkey, L. K., & Hecht, M. L. (2010). A model of effects of narrative as culture-centric health promotion. *Journal of Health Communication*, *15*, 114-135. doi:10.1080/10810730903528017

Madras, B. K. (2010). Office of national drug control policy. *Annals of the New York Academy of Sciences*, *1187*, 370-402. doi:10.1111/j.1749-6632.2009.05278.x

McCabe, S. E., West, B. T., Morales, M., Cranford, J. A., & Boyd, C. J. (2007). Does early onset of non-medical use of prescription drugs predict subsequent prescription drug abuse and dependence? Results from a national study. *Addiction*, *102*, 1920-1930. doi:10.1111/j.1360-0443.2007.02015.x.

Miech, R. A., Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2015). *Monitoring the Future national survey results on drug use*, *1975–2014: Volume I, secondary school students*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.

Miller-Day, M. (2008). Talking to youth about drugs: What do youth say about parental strategies? *Family Relations*, *57*, 1-12. doi:10.1111/j.1741-3729.2007.00478.x

Miller-Day, M., & Hecht, M. L. (2013). Narrative means to preventative ends: A narrative

engagement framework for designing prevention interventions. *Health Communication*, *28*, 657-670. doi:10.1080/10410236.2012.762861

Miller-Day, M., & Dodd, A. (2004). Toward a descriptive model of parent-offspring communication about alcohol and other drugs. *Journal of Social and Personal Relationships*, *21*, 69-91. doi:10.1177/0265407504039846

Miller-Day, M., & Kam, J. A. (2010). More than just openness: Developing and validating a measure of targeted parent-child communication about alcohol. *Health Communication*, *25*, 293-302. doi:10.1080/10410231003698952

Murthy, V. H. (2017). Facing addiction in the United States: The surgeon general's report of alcohol, drugs, and health. *Journal of American Medical Association*, *317*, 133-134. doi:10.1001/jama.2016.18215

Muthén, L. K., & Muthén, B. O. (2008-2015). *Mplus User's Guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.

Nagin, D. S. (2005). *Group-based modeling of development*. Cambridge, MA: Harvard University Press.

Nation, M., Crusto, C., Wandersman, A., Kumpfer, K. L., Seybolt, D., Morrissey-Kane, E., & Davino, K. (2003). What works in prevention: Principles of effective prevention programs. *American Psychologist*, *58*, 449-456. doi:10.1037/0003-066X.58.6-7.449

Oetting, E. R., & Donnermeyer, J. F. (1998). Primary socialization theory: The etiology of drug use and deviance. *Substance Use & Misuse*, *33*, 995–1026. doi:10.3109/10826089809056252

Pettigrew, J., Graham, J. W., Miller-Day, M., Hecht, M. L., Krieger, J. L., & Shin, Y. (2015) Adherence and delivery: Implementation quality and program outcomes for the seventh-grade keepin'it REAL program. *Prevention Science*, *16*, 90-99. doi:10.1007/s11121-014-0459-1

Pettigrew, J., Miller-Day, M., Shin, Y., Krieger, J. L., Hecht, M. L., & Graham, J. W. (2018). Parental messages about substances in early adolescence: Extending a model of drug talk styles. *Health Communication*, *33*, 349-358. doi:10.1080/10410236.2017.1283565

Pettigrew, J., Shin, Y., Stein, J. B., & Raalte, L. J. (2017). Family communication and adolescent alcohol use in Nicaragua, Central America: A test of primary socialization theory. *Journal of Family Communication*, *17*, 33-48. doi:10.1080/15267431.2016.1251921

Reimuller, A., Hussong, A., & Ennett, S. T. (2011). The influence of alcohol-specific communication on adolescent alcohol use and alcohol-related consequences. *Prevention Science*, *12*, 389-400. doi:10.1007/s11121-011-0227-4

Shin, Y., & Hecht, M. L. (2013). Does parentification place Mexican-heritage youth at risk for substance use? Identifying the intervening nature of parent–child communication about alcohol. *Journal of Adolescence*, *36*, 149-159. doi:10.1016/j.adolescence.2012.10.010

Shin, Y., Lee, J. K., Lu, Y., & Hecht, M. L. (2016). Exploring parental influence on the progression of alcohol use in Mexican-heritage youth: A latent transition analysis. *Prevention Science*, *17*, 188-198. doi:10.1007/s11121-015-0596-1

Shin, Y., & Miller-Day, M. (2017). A longitudinal study of parental anti-substance-use socialization for early adolescents' substance use behaviors. *Communication Monographs, 84*, 277-297. doi:10.1080/03637751.2017.1300821

Spoth, R. L., Redmond, C., & Shin, C. (2001). Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*, *69*, 627–642. doi:10.1037/0022-006X.69.4.627

Substance Abuse and Mental Health Services Administration. (2013). *National survey of substance abuse treatment services (N-SSATS): 2012. Data on substance abuse treatment facilities* (BHSIS Series S-66, HHS Publication No. [SMA] 14-4809). Retrieved from https://www.samhsa.gov/data/sites/default/files/2012_National_Survey_of_Substance _Abuse_Treatment_Services/2012_National_Survey_of_Substance_Abuse_Treatmen t_Services.pdf

Van Der Vorst, H., Engels, R. C., Meeus, W., & Deković, M. (2006). The impact of alcohol-specific rules, parental norms about early drinking and parental alcohol use on adolescents' drinking behavior. *Journal of Child Psychology and Psychiatry*, *47*, 1299-1306. doi:10.1111/j.1469-7610.2006.01680.x

Williams, L. R., Ayers, S., Baldwin, A., & Marsiglia, F. F. (2016). Delaying youth substance-use initiation: A cluster randomized controlled trial of complementary youth and parenting interventions. *Journal of the Society for Social Work and Research*, *7*, 177–200. doi:10.1086/685298

Wong, M. M., Nigg, J. T., Zucker, R. A., Puttler, L. I., Fitzgerald, H. E., & Jester, J. M. (2006). Behavioral control and resiliency in the onset of alcohol and illicit drug use: A prospective study from preschool to adolescence. *Child Development, 77,* 1016-1033. doi:10.1111/j.1467-8624.2006.00916.x

Table 1. Frequency of Drug Talk Styles

Control Condition (*n* = 144)

Response	W1 (%)	W2 (%)	W3 (%)	W4 (%)	Mean (%)
Situated Direct	36.1 (*n* = 52)	34.7 (*n* = 50)	36.1 (*n* = 52)	31.9 (*n* = 46)	34.7
Ongoing Direct	36.1 (*n* = 52)	30.6 (*n* = 44)	23.6 (*n* = 34)	34.7 (*n* = 50)	31.3
Situated Indirect	12.5 (*n* = 18)	20.1 (*n* = 29)	22.9 (*n* = 33)	19.4 (*n* =28)	18.7
Ongoing Indirect	11.8 (*n* = 17)	11.8 (*n* = 17)	15.3 (*n* = 22)	11.8 (*n* =17)	12.7
Never Talked	3.5 (*n* = 5)	2.8 (*n* = 4)	2.1 (*n* = 3)	2.1 (*n* = 3)	2.6

Treatment Condition (*n* = 266)

Response	W1 (%)	W2 (%)	W3 (%)	W4 (%)	Mean (%)
Situated Direct	36.5 (*n* = 97)	38.3 (*n* = 102)	36.5 (*n* = 97)	34.2 (*n* = 91)	36.4
Ongoing Direct	31.6 (*n* = 84)	31.2 (*n* = 83)	25.6 (*n* = 68)	25.2 (*n* = 67)	28.4
Situated Indirect	16.9 (*n* = 45)	17.7 (*n* = 47)	23.7 (*n* = 63)	26.7 (*n* = 71)	21.3
Ongoing Indirect	9.8 (*n* = 26)	10.5 (*n* = 28)	12.8 (*n* = 34)	13.2 (*n* = 35)	11.6
Never Talked	5.3 (*n* = 14)	2.3 (*n* = 6)	1.5 (*n* = 4)	.8 (*n* = 2)	2.5

Figure 1. Visualized Results of LTA: Control Condition (7th to 9th grade)
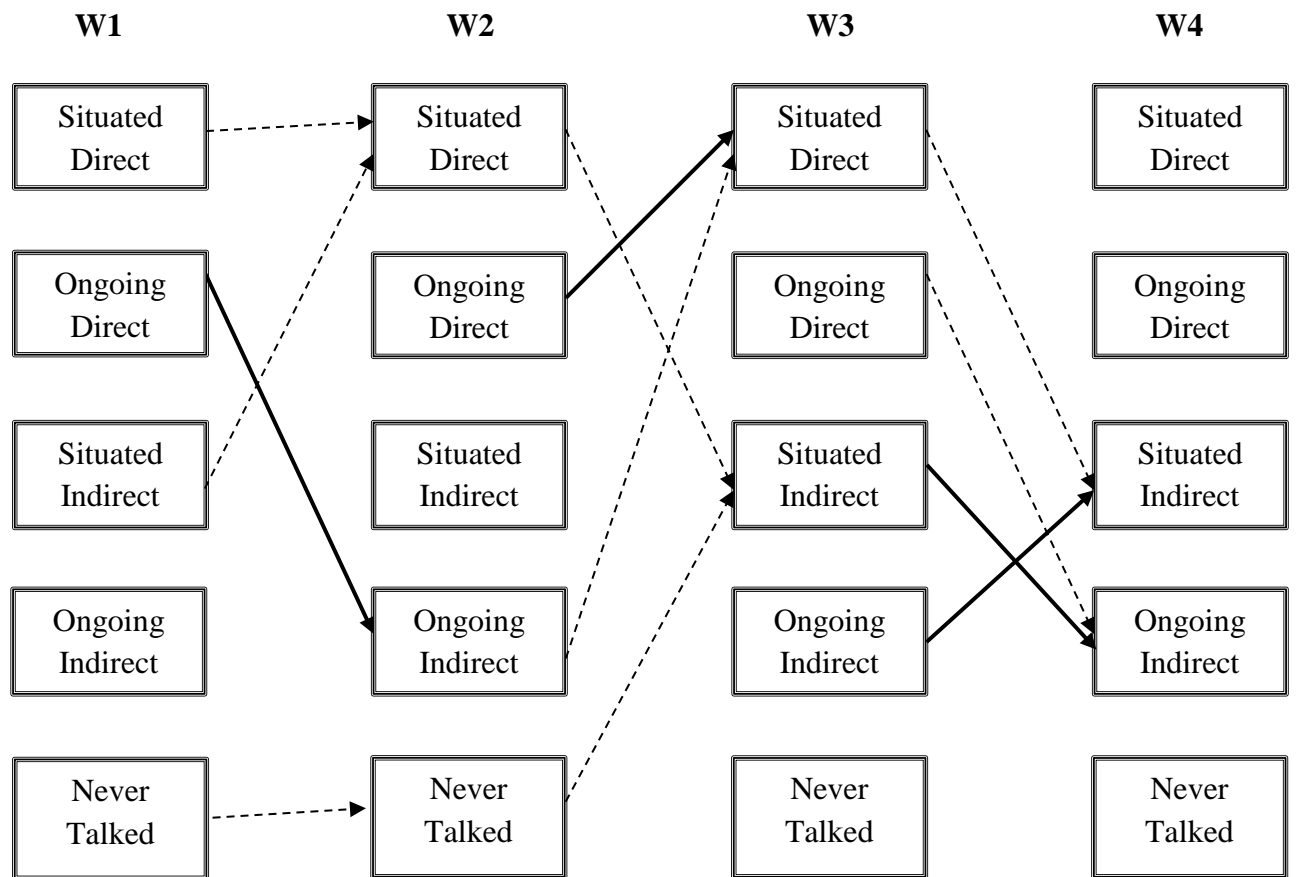
Note. Straight bold arrow represents transition probabilities greater than 70% (major transitions) and dotted arrow represents transitions probability greater 50% (moderate transitions).

Figure 2. Visualized Results of LTA: Treatment Condition (7th to 9th grade)
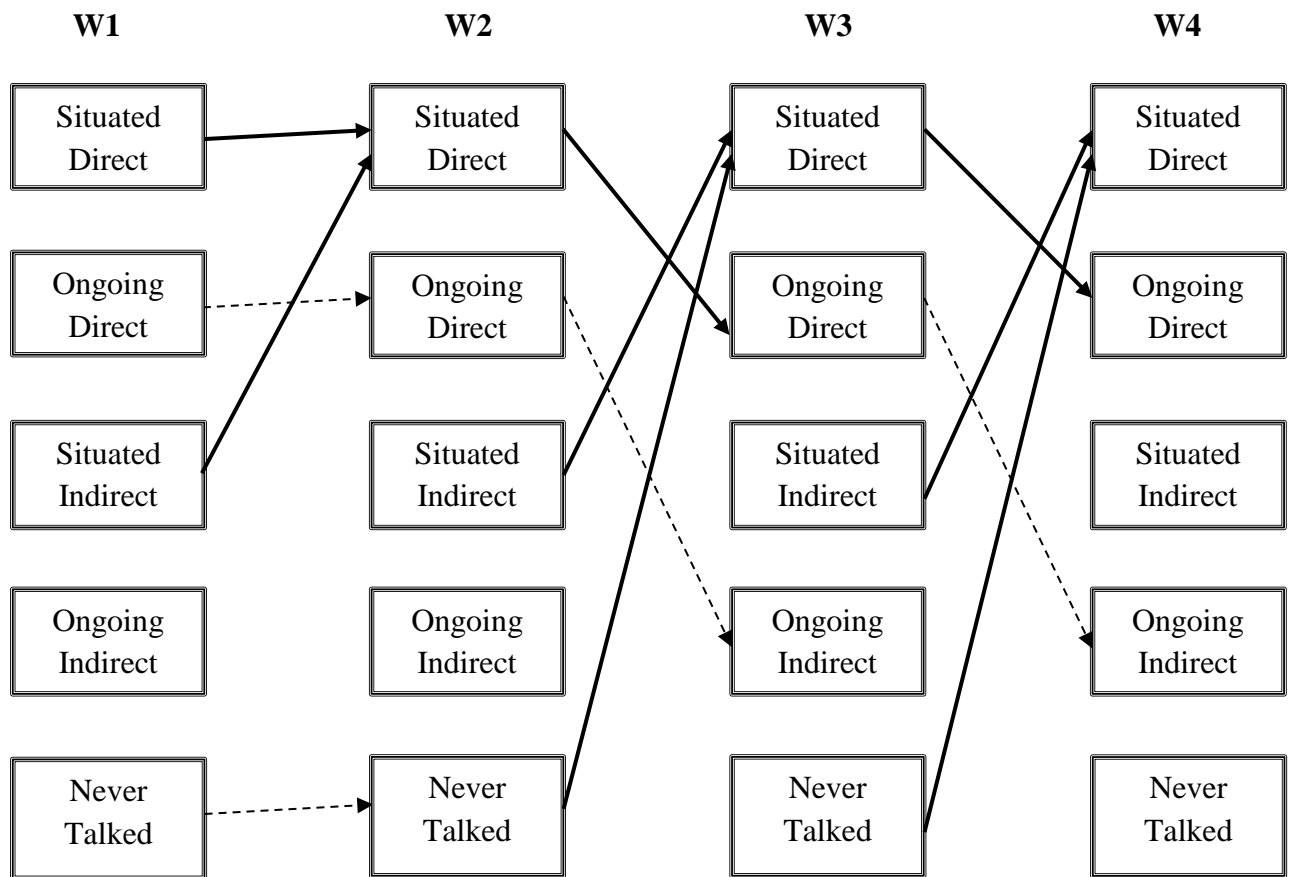
Note. Straight bold arrow represents transition probabilities greater than 70% (major transitions) and dotted arrow represents transitions probability greater 50% (moderate transitions).

Table 2. Latent Transition Probabilities of Control Condition

	Wave 2 Latent Class Membership				
Transition Probabilities	Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect	Never Talked
Wave 1 Latent Class Membership					
Situated Direct	0.505	0.000	0.000	0.000	0.495
Ongoing Direct	0.000	0.177	0.120	**0.703**	0.000
Situated Indirect	0.686	0.223	0.092	0.000	0.000
Ongoing Indirect	0.028	0.487	0.368	0.037	0.080
Never Talked	0.000	0.000	0.077	0.378	0.545

	Wave 3 Latent Class Membership				
Transition Probabilities	Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect	Never Talked
Wave 2 Latent Class Membership					
Situated Direct	0.000	0.139	0.579	0.000	0.282
Ongoing Direct	**1.000**	0.000	0.000	0.000	0.000
Situated Indirect	0.365	0.020	0.000	0.019	0.596
Ongoing Indirect	0.593	0.067	0.017	0.044	0.280
Never Talked	0.356	0.062	0.520	0.063	0.000

	Wave 4 Latent Class Membership				
Transition Probabilities	Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect	Never Talked
Wave 3 Latent Class Membership					
Situated Direct	0.000	0.000	0.521	0.276	0.204
Ongoing Direct	0.244	0.000	0.113	0.588	0.056
Situated Indirect	0.154	0.000	0.089	**0.735**	0.021
Ongoing Indirect	0.000	0.145	**0.796**	0.059	0.000
Never Talked	0.282	0.282	0.055	0.327	0.054

Note. Bold number represents transition probabilities greater than 70% (major transitions)

Table 3. Latent Transition Probabilities of Treatment Condition

	Wave 2 Latent Class Membership				
Transition Probabilities	Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect	Never Talked
Wave 1 Latent Class Membership					
Situated Direct	**0.771**	0.000	0.000	0.000	0.229
Ongoing Direct	0.000	0.676	0.068	0.256	0.000
Situated Indirect	**0.796**	0.122	0.000	0.000	0.082
Ongoing Indirect	0.079	0.368	0.274	0.111	0.168
Never Talked	0.000	0.000	0.034	0.407	0.559

	Wave 3 Latent Class Membership				
Transition Probabilities	Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect	Never Talked
Wave 2 Latent Class Membership					
Situated Direct	0.000	**0.728**	0.086	0.186	0.000
Ongoing Direct	0.201	0.000	0.001	0.580	0.218
Situated Indirect	**0.707**	0.000	0.087	0.083	0.123
Ongoing Indirect	0.000	0.385	0.000	0.346	0.269
Never Talked	**0.957**	0.000	0.043	0.000	0.000

	Wave 4 Latent Class Membership				
Transition Probabilities	Situated Direct	Ongoing Direct	Situated Indirect	Ongoing Indirect	Never Talked
Wave 3 Latent Class Membership					
Situated Direct	0.000	**0.773**	0.034	0.180	0.012
Ongoing Direct	0.192	0.000	0.000	0.646	0.162
Situated Indirect	**0.739**	0.000	0.040	0.065	0.156
Ongoing Indirect	0.000	0.000	0.000	0.386	0.614
Never Talked	**0.838**	0.000	0.162	0.000	0.000

Note. Bold number represents transition probabilities greater than 70% (major transitions)