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# Playforward: Elm City Stories Interactive Group-Based Curriculum: An Intervention On Hiv Risk Behaviors In Urban Racial And Ethnic Minority Youth

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***PlayForward: Elm City Stories* Interactive Group-Based  
Curriculum: An intervention on HIV risk behaviors in urban, racial  
and ethnic minority youth**

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There is a growing epidemic of HIV in young, racial and ethnic minority populations (Centers for Disease Control and Prevention, 2008). *PlayForward: Elm City Stories* is an evidence-based, theory-driven videogame intervention developed by the Yale School of Medicine research group, play2PREVENT to impact HIV risk behaviors in urban racial and ethnic minority youth, ages 11-14 (play2PREVENT). The *PlayForward: Elm City Stories* intervention manual seeks to build on the videogame by adding an in-person group dimension to the individualized intervention. The manual provides a group-based interactive, in-person curriculum addressing decision-making and risk behaviors for HIV exposure among 11-14 year olds, and an implementation guide for the *PlayForward: Elm City Stories* videogame intervention. This manual is intended for youth program staff using the *PlayForward: Elm City Stories* videogame.

## Background

### *HIV in Young Racial & Ethnic Minority Populations*

*PlayForward: Elm City Stories* seeks to address the growing epidemic of HIV in young, racial and ethnic minority populations. More infections in the US in 2006 occurred among individuals aged 13-29 than any other age group (Centers for Disease Control and Prevention, 2008). Racial and ethnic minority groups are over-represented among these new cases. Black males between 13 and 29 have an incidence rate that is 7.1 times higher than their white male counterparts (2.2 times higher for Hispanic males), and black females are 14.7 times more likely to be infected than white females (3.8 times more likely for Hispanic females). Alarmingly, fewer than 50% of adolescents and young adults are able to identify specific strategies to prevent HIV (UNAIDS, 2006).

Racial and ethnic minority adolescents exhibit highly prevalent HIV risk behaviors. According to the CDC's Youth Risk Behavior Surveillance, 3%, 7%, and 4% of white, black, and Hispanic girls, respectively, and 6%, 26%, and 12% of white, black and Hispanic boys, respectively, have had sexual intercourse before the age of 13. In addition, 18% of all 9<sup>th</sup> grade girls and 22% of all 9<sup>th</sup> grade boys reported being sexually active (Centers for Disease Control and Prevention, 2004). These numbers increase by the 12<sup>th</sup> grade with 57% of girls and 48% of boys reporting being sexually active (Centers for Disease Control and Prevention, 2004). A recent CDC report highlighted the high rate of unprotected sex, particularly in racial and ethnic minority teens (Centers for Disease Control and Prevention, 2004), while data from the 2003-04 National Health and Nutrition Examination Survey revealed that one in four teenage girls in the U.S. has a sexually transmitted infection, with the highest percentage, greater than 50%, of these 14 to 19 year olds being black girls (Hampton, 2008). Furthermore, 22% of all 9<sup>th</sup> graders drank or used drugs prior to the last time they had sexual intercourse, a behavior that increases sexual risk-taking (Partnership for a Drug Free America, 2007; Bachanas et al., 2002).

By targeting early adolescents, ages 11-14, we can take advantage of a "window of opportunity" to impact risk behaviors before they become ingrained in the individual's pattern of behavior. There is compelling data that the maturation of specific brain regions and their connecting pathways occurs on a continuous basis during adolescence but then fades as individuals reach adulthood (Paus et al., 1999). This development of the brain occurs in a non-linear pathway, in which adolescents exhibit an enhanced response to the anticipation of rewards, compared with children and adults, but like children, have less control than adults making them more prone to making risky decisions (Casey, Jones & Hare, 2008). In the adolescent period of

brain development, individuals are also more influenced by social and emotional contextual factors, impacting their propensity to engage in risky behaviors within a context in which social and emotional factors are highly at play (Steinberg, 2005). In addition, the adolescent brain is particularly vulnerable to the effects of substances, resulting in the observation that for many, addiction is a condition acquired in youth (Heyman & Adger, 1997). By intervening with adolescents, we can prevent the adoption of new HIV risk behaviors or reduce current risk behaviors.

### *HIV Risk Behaviors*

There are a number of risk reduction behaviors available to reduce adolescents' risk of being infected with HIV through sexual contact. The most effective way to reduce risk for HIV infection is delaying sexual initiation and practicing abstinence (O'Donnell, O'Donnell & Stueve, 2001). By delaying and reducing sexual activity, adolescents lessen their opportunities for infection. In addition, by delaying sexual initiation until they are older, adolescents increase their chances that they will be able to navigate sexual encounters and use safer sex practices (O'Donnell, O'Donnell & Stueve, 2001). Adolescents who are sexually active, or will become sexually active, can reduce their risk for HIV infection by reducing the number of partners they have and/or avoiding having concurrent partners, and using barrier protection like condoms during sexual encounters (Martina & Mirjam, 1997; Pinkerton & Abramson, 1997). Through sexual contact with a greater number of partners, adolescents expose themselves to more opportunities to have a sexual encounter with someone who is HIV-positive. When adolescents engage in sexual activity with multiple partners over the same period of time, they also increase their risk of passing HIV on to another partner (Martina & Mirjam, 1997). Barrier protection can significantly reduce the risk of contracting HIV during a sexual encounter. When used consistently, condoms are 90-95% effective in preventing HIV transmission in sero-discordant pairs (Pinkerton & Abramson, 1997). By teaching adolescents the information and skills they need to navigate sexual situations safely before they begin engaging in risky behaviors, we can promote healthy behavior before unhealthy behavior becomes ingrained in their pattern of behavior and reduce their risk of infection for HIV. Furthermore, by delaying their sexual initiation, we can reduce their immediate risk for HIV infection and allow them time to learn the skills they need to navigate sexual situations safely in the future.

### *PlayForward: Elm City Stories Videogame*

With funding from the National Institute of Child Health and Human Development, Yale's Play2Prevent program developed an evidence-based, theory-driven interactive videogame to address the HIV epidemic within young, racial and ethnic minority populations. Building on the growing area of "serious games," Play2Prevent uses innovative evidence-based educational materials and targeted videogame interventions for risk reduction and prevention in youth and young adults. The first videogame, *PlayForward: Elm City Stories* focuses on knowledge and behavior change around behaviors that put individuals at risk for HIV. The project is currently in its randomized controlled trial phase, to evaluate the efficacy of the intervention. If proven efficacious in risk reduction and primary prevention of HIV and other STIs, this videogame-based intervention has great potential for long-term and broad-based dissemination and incorporation into youth programs.



### *Group-Based Intervention Activities*

Youth in the developmental period targeted by *Play Forward: Elm City Stories* are particularly receptive to group interventions, as they are in a period of heightened sensitivity to their peers. Research findings suggest that peers can influence sexual behaviors in adolescents such as delay in sexual initiation (Ali & Dwyer, 2011; Carvajal et al., 1999; Aarons et al., 2000) and condom use (Ali, Amialchuk & Dwyer, 2011; Smith et al., 2000; Kirby, 2007). Group interventions that utilize peers have been shown to influence positive changes in attitudes (Caron, Otis, & Pilote, 1998), self-efficacy (Smith et al., 2000), and intention regarding condom use (Caron, Otis, & Pilote, 1998) and attitudes towards abstinence (Caron, Otis & Pilote, 1998), self-efficacy to refuse sex (Aarons et al., 2000), and more conservative sexual norms (Mellanby, Rees & Tripp, 2000). Experimental and empirical studies have also demonstrated the strong influences of peers on risk assessments, expectations, and subjective beliefs (Kohler, Behrman & Watkins, 2007). Interactions in peer groups offer opportunities for individuals to exchange and evaluate information, to learn social norms, to develop behavioral skills, and to influence each other's attitudes and behaviors (Kohler, Behrman & Watkins, 2007). These interactions are increasingly recognized to have important effects on knowledge and attitudes about risk, social support for risk or prevention, behavioral skills for prevention, and risk or preventive behaviors (Scherer & Cho, 2003). In addition, an online study of the effects of network structure on the spread of health behavior through an Internet-based health community consisting of participants and matched "health buddies" found that social reinforcement from multiple health buddies increased participants' willingness to adopt the behavior under study (Centola, 2010). By incorporating group-based activities and discussions in the curriculum to complement the individualized videogame, this intervention will build upon the videogame and utilize youths' peer orientation to influence their risk behaviors.

## **The Intervention Model**

### **Intervention Objectives**

The *PlayForward: Elm City Stories* project seeks to address the growing prevalence of HIV in young, racial and ethnic minority populations by building risk knowledge and practicing risk reduction skills. Paired with the *PlayForward: Elm City Stories* videogame, the group-based intervention curriculum will build on the knowledge gained in the videogame by giving adolescents the opportunity to learn and practice risk reduction skills with their peers and mentors in a context that reflects the real-life social situations they will face. Group-based activities will focus on increasing knowledge about sexual risks and risk reduction strategies, building self-efficacy of negotiating sexual activity and barrier protection use, correcting perceptions of peer sexual norms and reducing alcohol and other drug use in order to reduce adolescents' number of sexual partners, delay sexual initiation and increase the use of barrier protection during sexual activity.

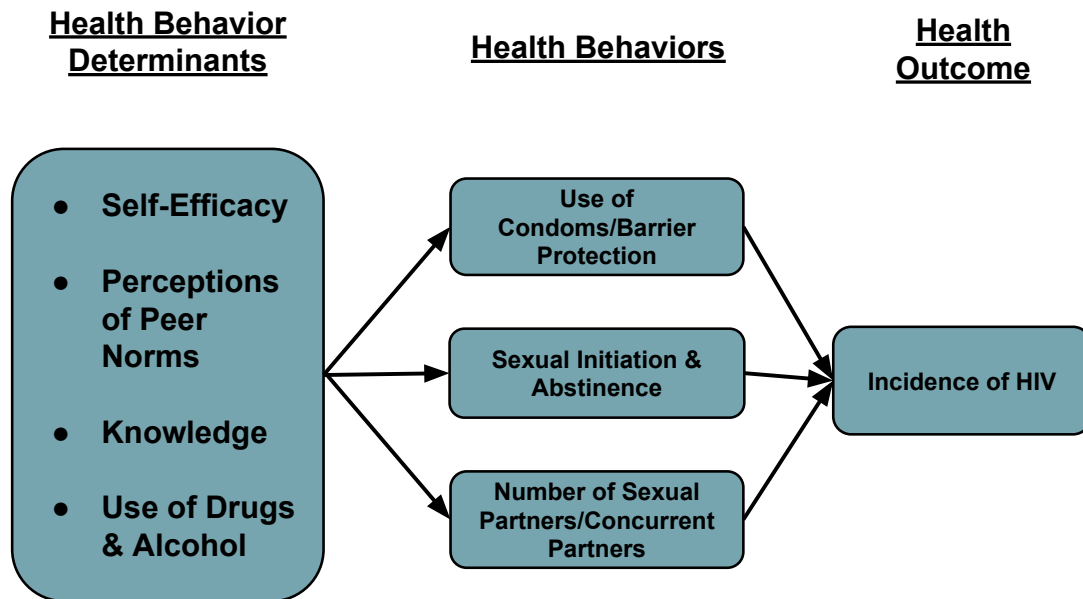
### **Social Cognitive Theory**

The group-based intervention model was built using Social Cognitive Theory (also known as Social Learning Theory). The Social Cognitive Theory (SCT) of behavior change views learning as a dynamic process requiring attention to health behavior knowledge, motivation for behavior change, behavior skills and self-efficacy for those skills, and the social environment (Bandura, 1998). SCT acknowledges that knowledge about health risk and risk

reduction alone is insufficient to incite behavior change. Interventions must also build individuals' skills and self-efficacy for risk reduction behaviors and build the perceived and actual social support for those behaviors. SCT has been used successfully for a number of health behavior interventions, including positive youth and social development, reduction of sexual risk behavior (Jemmott, Jemmott, & Fong, 1992; Stanton et al., 1996; St Lawrence et al., 1995; Coyle, Basen-Engquist, Kirby et al., 2001; Rotheram-Borus, Koopman, Haignere & Davies, 1991), and drug abuse prevention programs (Langlois, Petosa & Hallam, 1999; Perry et al., 1996; Jones, McDonald, Fiore, Arrington & Randall, 1990).

The current intervention utilizes SCT in identifying the determinants of the HIV risk behaviors that may expose adolescents to HIV through sexual contact and intravenous drug use. Group-based intervention activities will target the following determinants of new HIV infections transmitted through sexual contact and intravenous drug use: knowledge of risk and risk reduction strategies, self-efficacy of protective behaviors such as negotiating sexual activity and condom use, and perceptions of peer norms for sexual behavior. A group-based model is used to draw upon social support, a key aspect of SCT, to alter adolescents' perceptions of their peers' behaviors and social norms.

### HIV Risk Behaviors Determinant Model



## Model Determinants

### *Knowledge of HIV Risk & Risk Reduction Options*

While knowledge is not strongly independently associated with the HIV risk behaviors addressed in this model (Bachanas et al., 2002; Romer et al., 1994), having knowledge about health risk behaviors, their consequences and the risk reduction options, is a necessary precursor to changing risk behaviors (Bandura, 1998). HIV knowledge was weakly associated with pregnancy history and condom use in young racial and ethnic minority teens, but was not significantly associated with sexual initiation, number of partners or STD history (Bachanas et al., 2002; Romer et al., 2004). Similarly, adolescents who did not know someone with HIV were only slightly more likely (Adjusted OR = 1.8; 95% CI 1.3-2.4) to have sex without a condom than their peers who did know someone with HIV (Rickman et al., 1994). Despite the weak association between knowledge and risk behaviors, increasing knowledge is a fundamental and necessary precursor to behavior change. SCT indicates that knowledge about a health risk, including alternatives, consequences to engaging in risk behaviors, and the benefits of not engaging in the risk behavior or choosing an alternative are necessary to allow adolescents to develop their values and evaluations associated with engaging in health risk behaviors (Bandura, 1998).

Intervention components targeting knowledge will focus on altering adolescents' attitudes towards engaging in HIV risk behaviors using Expectancy-Value Theory and Prospect Theory. Expectancy-Value Theory posits that to predict and change whether an individual will engage in a behavior, one must understand the elements that affect the individual's intention and alter their perception of the potential outcomes (Borders, Earlywine & Huey, 2004). By impacting the value an individual places on each of the potential outcomes and their belief that an outcome will occur, one can impact their intention to engage in that behavior (Mazis, Ahtola & Kippel, 1975). Prospect Theory, also known as message framing, states that individuals will respond differently to factually equivalent information based on how it is presented (Kahneman & Tversky, 1979). Specifically, messages may either be framed in terms of the negative outcomes associated with a behavior (loss-framed), or in terms of the positive outcomes associated with the behavior (gain-framed). While loss-framed messaging is effective in promoting one-time behaviors such as screenings, gain-framed messages are more effective than loss-framed messages at promoting preventative health behaviors, such as condom use and avoiding drugs (Rothman & Salovey, 1997). The current intervention will primarily use gain-framed messaging to promote risk reduction behaviors like condom use, abstinence and avoiding drugs and alcohol by impacting adolescents' perceptions of the potential outcomes of their behavior and the value they place on those outcomes. Primed with the proper knowledge, adolescents will be better equipped to face the health-compromising social situations they will encounter as they grow older.

### *Self-Efficacy*

Self-efficacy refers to an individual's belief about their ability to perform a particular health behavior (O'Leary, 1985; Bandura, 1998). Self-efficacy is a key part of SCT, which states that individuals must have the skills they need to change their health behaviors as well as confidence that they can perform those skills in the context of their daily lives in order to affect health behaviors (O'Leary, 1985; Bandura, 1998). A meta-analysis of the literature on health promotion found that self-efficacy was the strongest predictor of a healthy lifestyle (Gillis,

1993). This holds true for HIV risk behaviors as well. In a study of young racial and ethnic minority teens, ages 12 to 15, sexual self efficacy was significantly associated with age at sexual initiation, number of partners in the last 60 days and STI history (Bachanas et al., 2002).

Research suggests that self-efficacy has the greatest effect when targeted at specific behaviors. While general sexual self-efficacy was only a marginally significant predictor of condom use frequency among racial and ethnic minority adolescents, self-efficacy of demanding condom use was significantly associated with consistent condom use (Bachanas et al., 2002; DiClemente et al., 1996). Those with high self-efficacy for demanding condom use were ten times more likely than those with low self-efficacy for demanding condom use to report consistent condom use (Bachanas et al., 2002).

Self-efficacy may be targeted through repetition of a skill in a context similar to individuals' real life context, goal setting, and the identification of barriers to health behaviors (O'Leary, 1985; Bandura, 1998). Inoculation Theory proposes that individuals' susceptibility to persuasive arguments can be reduced through exposure to information about potentially harmful behaviors and repetitive practice of refusal skills (Duryea, Ransom & English, 1990). Through repetitive exposure and practice, individuals are effectively "inoculated" against persuasive arguments and are able to resist unhealthy behaviors. In addition to repeatedly practicing health behavior skills, individuals must receive feedback about their performance and reinforcement of the positive effects of their behavior (O'Leary, 1985).

In the current intervention, self-efficacy for refusing drug use, abstaining from alcohol, and avoiding risky sexual situations (via abstinence or condom use) will be targeted by increasing adolescents' refusal and reasoning skills in these areas, allowing them to practice those skills through repetition, goal setting, and identification of barriers to healthy behaviors and ways to overcome those barriers. Key to increasing adolescents' self-efficacy in these areas will be teaching self-awareness and resistance to social pressure. In order to change adolescents' health behaviors, the current intervention will allow adolescents to learn and practice skills in identifying risky situations, determining the possible courses of action and making judgments about which course of action to take. Adolescents will receive immediate feedback about their performance from their peers and facilitators and facilitators will guide them in reflection on the positive or negative effects of their choices.

The specific skills for which self-efficacy will be targeted in the intervention include decision-making and reasoning skills (i.e., assessing probability and thinking systematically) in each target HIV risk behavior (Beyth-Marom et al., 1991; Fischhoff, Crowell & Kipke, 1999). Beyth-Marom and colleagues identify five steps to decision-making: (1) listing relevant choices, (2) identifying the potential consequences of each choice, (3) assessing the likelihood that each consequence will occur, (4) placing a value on each of the consequences, and (5) combining all of this information to decide which choice is most appealing (1991). As teens develop more autonomy, they are increasingly required to utilize these decision-making skills. By increasing their self-efficacy for these skills before they begin engaging in risky behaviors, we can give them the skills and confidence to avoid HIV risk behaviors.

Teaching adolescents relevant decision-making and reasoning skills has been successful in a number of areas for promoting healthy behaviors (Fischhoff, Crowell & Kipke, 1999). Improving decision-making and reasoning skills has been shown to be effective for promoting safe sex behaviors, delaying sexual initiation, decreasing the frequency of sexual activity and decreasing use of alcohol and drugs (Jemmott, Jemmott & Fong, 1998; St. Lawrence et al., 1995; Epstein, Griffin & Botvin, 2000). In particular, a randomized controlled trial found that a skills-

based intervention with African American and Hispanic girls (mean age 15.5 years) was more successful in decreasing unprotected sexual intercourse and number of sexual partners, and positive tests for STIs than an information-based intervention or control groups at 12 month follow-up (Jemmott, Jemmott, Braveman & Fong, 2005). The skills-based intervention differed from the information-based intervention by allowing participants to practice the correctly using condom and role-playing negotiating using condoms and discussing perceived barriers to condom use and how to surmount those barriers (Jemmott, Jemmott, Braveman & Fong, 2005). The current intervention will take this skills-based approach, incorporating decision-making and reasoning skills into the group activities.

According to SCT, the interplay between the individual and their environmental factors determines their health behaviors, so it is essential for building relevant self-efficacy that intervention activities reflect the social environments that adolescents will find themselves in when making decisions about their health behaviors (Glanz et al., 2002). Intervention activities are tailored to the experiences and abilities of urban racial and ethnic minority youth, as determined by focus groups with urban, racial and ethnic minority youth in the New Haven area conducted for the original videogame intervention, to be discussed in the following section. Through repetitive exposure to the risky situations they may face and practice of refusal skills, this intervention will increase self-efficacy for the target behaviors and thus increase the likelihood that adolescents will engage in protective behaviors.

#### *Perceptions of Peer Attitudes/Social Norms*

A central tenant of SCT is that social environments have a great impact on the health behaviors of individuals (Glanz et al., 2002). In SCT, health behaviors are a product of the interaction between personal cognitive, affective and biological factors, and environmental factors, such as the social milieu (Glanz et al., 2002). Adolescents' perception of peer norms about health risk behaviors and their ability to resist social pressure to engage in health risk behaviors have a strong effect on their HIV risk behaviors. In a study of young African American adolescents, ages nine to 15 who were residents of public housing, adolescent perceptions of peer sexual behaviors and condom use were significantly associated with adolescent sexual activity and initiation and condom use frequency (Romer et al., 1994). Another study of 164 young racial and ethnic minority teens found that perception of peer norms was significantly associated with number of sexual partners in the last 60 days, STI history and condom frequency (Bachanas et al., 2002). Adolescents and young adults who perceived that peers supported condom use were 4.2 times as likely as those who did not to report consistent condom use (Bachanas et al., 2002).

As discussed above, peer norms have a particularly strong influence on young adolescents, as young adolescents begin to experience more autonomy from parents and spend more time with peers (Kohler, Behrman & Watkins, 2007). In a study of 164 adolescents aged 12 to 19, peer norms had a greater impact on risky sexual behaviors in younger teens (12-15) than in older teens (16-19) (Bachanas et al., 2002). Correcting the misperceptions about peer norms and increasing the ability to resist peer pressure to engage in risky behaviors in young adolescents will be central to changing their HIV risk behaviors.

The current intervention will target peer norms by correcting false perceptions of peer norms and increasing adolescents' ability to resist complying with peers engaging in HIV risk behaviors. Interventions correcting misperceptions about peer norms through normative feedback have successfully impacted other social behaviors such as college drinking, suggesting that

intervention components targeting norm misperceptions will be successful (Neighbors, Larimer & Lewis, 2004; Berkowitz, 2002; Perkins & Craig, 2006).

To target adolescents' ability to resist peer pressure, the intervention again uses Inoculation Theory, allowing adolescents to repeatedly practice decision-making and reasoning skills in relevant social settings, helping them to predict, identify and resist the ways in which peers may pressure them to participate in HIV risk behaviors (Duryea, Ransom & English, 1990). As with activities targeting self-efficacy, intervention activities targeting social norms must mirror adolescents' real social context as closely as possible in order to promote relevant skills and allow youth to practice overcoming the social barriers they will face in resisting HIV risk behaviors (O'Leary, 1985). By allowing adolescents to develop health behavior skills for HIV risk reduction through group activities, the current intervention increases the degree to which intervention activities mimic real life social situations and promotes collective development of positive peer norms. Research suggests that interventions targeting resistance to peer norms are most successful when coupled with corrections of misperceptions and when they target passive forms of pressure (i.e. social modeling) in addition to the more commonly taught refusal skills (i.e. refusing a direct offer of drugs or alcohol) (Donaldson, Graham, Piccin & Hansen, 1995).

In addition, adolescents' perceptions of their ties to adults in their community may affect their health behaviors. For example, adolescent girls who spoke with their mother about condom use demonstrated higher skill communicating about sex, more comfort communicating about sex and a more favorable endorsement of condoms than their peers who had not communicated about condoms with their mothers (Miller & Whitaker, 2001). In addition, young adolescents who perceived a high degree of parental monitoring were significantly less likely to have an early age of sexual initiation than those who perceived a low level of parental monitoring (Romer et al., 1994). Intervention activities will highlight ties to role models within adolescents' communities, developing their sense of responsibility and models for positive behavior. While previous interventions have focused primarily on adolescent-parent relationships, the current intervention recognizes that other adult mentors may play a large role in adolescents' health behaviors, and allows for the development of these role model relationships as well.

### *Alcohol and Other Drugs*

Use of alcohol and other drugs is highly prevalent among adolescents. By the time they enter high school, 36.2% of adolescents have had one or more drinks of alcohol on one or more days in the past 30 days, and by twelfth grade, that number has risen to 55.9% (Centers for Disease Control and Prevention, 2004). In ninth grade, 19.8% of students had participated in binge drinking in the past 30 days, while in twelfth grade, 37.2% of students had (Centers for Disease Control and Prevention, 2004). Use of marijuana and other drugs follows similar increasing patterns through high school (Centers for Disease Control and Prevention, 2004). Beyond the inherent risk involved in drug and alcohol use, the use of drugs and alcohol often precipitates sexual activity in youth while simultaneously impairing youths' ability to negotiate for safer sexual practices like barrier protection use (Bachanas et al., 2002). As stated above, 22% of all 9<sup>th</sup> graders drank or used drugs prior to the last time they had sexual intercourse (Centers for Disease Control and Prevention, 2004). Use of drugs and alcohol in the past three months is associated with younger age at sexual initiation, increased number of partners in the last 60 days, greater history of STIs, greater history of pregnancy and reduced frequency of condom use (Bachanas et al., 2002).

Though drug and alcohol use constitutes a determinant of HIV risk behaviors, it is also in itself a health risk behavior, and will be targeted in this intervention through the lens of Social Cognitive Theory, by increasing knowledge, influencing perceptions of and resistance to peer norms and increasing self-efficacy to abstain from drug and alcohol use. A meta-analysis of 207 universal school-based drug prevention programs found that interventions that were interactive and fostered development of interpersonal skills showed significantly larger effects on self-reported drug use than did non-interactive, lecture-based programs that stress drug knowledge (Tobler et al., 2000). In addition, interventions that stressed resistance to subtle pressure and correction of misconceptions about normative behavior were successful in preventing alcohol, marijuana and cigarette use in adolescents (Hansen & Graham, 1991; Donaldson, Graham, Piccin & Hansen, 1995). Through an interactive program focused on correcting misconceptions about peer norms and increasing self-efficacy for resisting subtle peer pressure, the current intervention aims to prevent the use of alcohol and other drugs in order to increase safe sex practices.

### **Tailoring Activities to Urban, Racial and Ethnic Minority Youth**

Intervention activities are tailored to the experiences of urban racial and ethnic minority youth, as determined by 5 focus groups with 5-7 urban, racial and ethnic minority youth in the New Haven area conducted for the original videogame intervention. While the primary focus group results pertained directly to videogame development, several themes from these focus groups influenced the development of in-person group-based activities. These themes included (1) the role of older family members in pressuring younger adolescents to initiate sexual activity and drug and alcohol use, (2) the greater salience of pregnancy risk over STI risk (3) locations and scenarios that youth in this population face, such as being offered alcohol or cigarettes in the park and (4) the language that youth in this population use. This information was incorporated into vignettes and activity prompts. In addition, because the risk of pregnancy was more salient with these populations than the risk of STIs, the group-based intervention activities aimed to increase the value that participants place on STIs as potential risks of sexual activity, and aimed to couple risk reduction strategies for pregnancy and STIs, to increase the chances that participants would adopt risk reduction strategies for both. It is a limitation of this intervention's development that focus groups specifically designed to address the activities being developed for this intervention were not able to be conducted before development of the intervention, due to resource limitations. However, focus groups will be conducted using the first iteration of the activities that appear in this manual during summer 2014, and so that further iterations of the activities can be developed and tailored to this population. Focus groups will also be conducted with youth program staff to further refine the tailoring to this population and use their experience working with youth in this population to adapt the activities for feasibility. Activities' relevance to the context of urban racial and ethnic minority youth and tailoring to their abilities (e.g. reading level, attention span etc.) will also be influenced by the experience of researchers on the play2PREVENT who have worked extensively with this population in the greater New Haven area, as activities are reviewed and work-shopped by the play2PREVENT team.

## Intervention Structure

The *PlayForward: Elm City Stories* group-based activity curriculum will accompany the *PlayForward: Elm City Stories* iPad videogame. The iPad videogame allows youth to create an avatar to lead through twelve levels of interactive gameplay, with two levels based on each grade from 7<sup>th</sup> to 12<sup>th</sup> grade. In each level, youth help their avatar navigate a plotline, collecting clues about the people and environments around them that will help them change the harmful decisions their avatar has made. At the end of each gameplay session, youth exit the game through the epilogue, which shows them a comic book story of how their choices in the game affected their avatar's future, so that they may connect their present-day decisions with future consequences. The themes in the videogame levels cover cheating in school, street racing, pre-sexual and sexual activities, pregnancy risk, HIV and other STI risk, alcohol and other drug use, and employment and money-spending. Within each level, participants must complete mini-game challenges. Mini-game challenges target knowledge about pre-sexual activity, sexual activity and alcohol and other drugs, decision-making skills regarding people who are good or bad influences, development of goals for the future, skills in resistance to social pressure and skills in prioritizing and risk assessment. In-person group-based activities will compliment and build upon the information and skills learned in the videogame and follow the themes in the videogame levels. The structure of some intervention activities will also reflect the structure of the videogame challenges.

Group-based activities will be presented in the form of a manual, which will include a walkthrough guide of the videogame levels and mini-game challenges to allow facilitators to aid adolescents with the videogame, discussion questions, and level quizzes. Interactive group activities will appear at the end of each unit of the manual, corresponding with each level in the videogame. The videogame is typically administered in 12 75-minute sessions. Each of the 12 45-minute periods of group-based activities are intended to be conducted after each session of videogame play, as information and skills presented in the game will be reinforced in the activities.

The manual is intended to be used by youth program staff (after-school programs, in class or summer programs), who will administer the videogame intervention along with the interactive group-based activities. Because youth program staff will not be given any training when administering the intervention, it is important that the manual be user-friendly and self-explanatory. While having regular program staff facilitate the intervention introduces more risk that the information will not be presented uniformly, there are several benefits to having program staff facilitate (Jemmott & Jemmott, 2000). First, crafting the intervention to be easily administered by regular program staff allows for broad dissemination beyond the abilities of a single program. Most importantly, as Play2Prevent research staff have observed through the randomized controlled trial of the videogame intervention in local youth programs, oftentimes program staff are important role models in adolescents' lives. By allowing existing staff to facilitate, the *PlayForward* intervention allows for the development of lasting relationships between adolescents and important role models in their lives such that these role models may be used as resources on topics like sexual activity and substance use in the future. In addition, evaluation of past interventions suggests that individuals exhibit greater buy-in and see greater behavior change when people more closely resembling participants in race and background facilitate the intervention (Jemmott & Jemmott, 2000). Adolescents may be more willing to participate fully with adults with whom they are comfortable and when information is



communicated from a trusted source. Furthermore, core information increasing knowledge and skills is presented through the videogame, allowing for a degree of standardization across programs regardless of facilitator’s skill level and intervention-specific knowledge.

The group-based interactive curriculum builds upon the existing videogame intervention by drawing upon social support and young adolescents’ peer orientation and by allowing them to practice skills in a setting more like their normal social context. Through group-based activities, adolescents can build knowledge and skills with the friends with whom they will face risky situations, allowing them to draw on social support as they learn together. As stated earlier, repeated practice of skills is essential to building self-efficacy. Equally important is building skills within a relevant context. While the videogame simulates social situations that urban racial and ethnic minority youth face, practicing those skills within a real-life group context will more closely simulate those social situations. Within the group, youth will face the real social pressures that they face in their lives, allowing for more relevant skill development within a controlled environment in which they will receive immediate feedback and reinforcement.

Previous successful interventions on HIV risk behaviors in older adolescents have been episodic rather than spanning a period of many weeks, and have ranged from eight program hours to 12.5 program hours (Jemmott, Jemmott, Braverman & Fong, 2005; Jemmott, Jemmott & Fong, 1998). Following the structure of the videogame, the group-based intervention will run for a total of eight program hours, with one 45-minute activity for each of the twelve levels of the videogame. Parting from the structure of past interventions, the twelve lessons will be given over a period of six to eight weeks (the typical time taken to play the entirety of the videogame intervention). While past interventions were delivered in fewer, longer sessions, Inoculation Theory holds that individuals learn best through repeated practice of skills over time, rather than through episodic doses, supporting this structure (Duryea, Ransom & English, 1990).

### Time Distribution for Determinants

Determinant	Effect Size	Changeability	Time Needed (% , Min)	Time Spent (Min)
Knowledge	Small	High	15%; 81	135
Self-Efficacy	Moderate	High	20%; 108	145
Peer Norms	Moderate	Moderate	30%; 162	155
Use of Alcohol and Other Drugs	High	Moderate	35%; 189	170
			Total Time: 540	
			Minutes	

## Summary of Group Intervention Activities

### Group Activities Summary Unit 1: Sexual Initiation

Activity	Activity Description	Determinant(s)	Time Needed	Justification for Activity Targeting Determinant
Myth or Fact - Risks in Sexual Activity	Divide into teams to compete identifying and explaining myths and facts. Conclude with discussion questions.	Knowledge	45 min	Interact with and compete with knowledge introduced in the PlayForward videogame, increasing understanding of the consequences of risky and healthy actions and the value of those consequences (Borders, Earlywine & Huey, 2004; Mazis, Ahtola & Kippel, 1975).
Identifying & Removing Yourself from Risky Situations - Sexual Activity 1	Group interactive vignette with decision points, reinforcing decision-making skills.	Self-Efficacy	45 min	Repetitive practice of decision-making skills in a real-life context and identify potential barriers to healthy behavior, increasing self-efficacy (O'Leary, 1985).
How Much Trust?	In groups, rank how much trust you would need to build before doing each of the activities on the activity cards with a significant other. Conclude with discussion.	Perception of Peer Norms & Social Support for Healthy Behavior	35 min	Increase perception of positive peer norms regarding sexual activity through discussion of those norms as a passive form of pressure (Donaldson, Graham, Piccin & Hansen, 1995).
Personal Reflection	Journal about someone who is a role model to you.	Self-Efficacy; Perception of Peer Norms & Social Support for Healthy Behavior	10 min	Increase feeling of social support and goals for future healthy behavior (Donaldson, Graham, Piccin & Hansen, 1995; O'Leary, 1985).

### Group Activities Summary Unit 2: Number of Partners

Activity	Activity Description	Determinant(s)	Time Needed	Justification for Activity Targeting Determinant
Understanding Sexual Risk	Interactive simulation of the way STIs spread from person-to-person, with an emphasis on the number of sexual partners and use of barrier protection. Conclude with discussion.	Knowledge	45 min	Act out the spread of STIs, increasing understanding of the consequences of risky and healthy actions and the value of those consequences (Borders, Earlywine & Huey, 2004; Mazis, Ahtola & Kippel, 1975).
Identifying & Removing Yourself from Risky Situations- Sexual Activity 2	Group interactive vignette with decision points, reinforcing decision-making skills.	Self-Efficacy; Alcohol & Other Drugs	35 min	Repetitive practice of decision-making skills in a real-life context and identify potential barriers to healthy behavior, increasing self-efficacy (O'Leary, 1985).
Personal Reflection	Journal about someone you are a role model to.	Self-Efficacy; Perception of Peer Norms & Social Support for Healthy Behavior	10 min	Increase feeling of social support and goals for future healthy behavior (Donaldson, Graham, Piccin & Hansen, 1995; O'Leary, 1985).
Refusal Skills Skit - Sexual Activity	From a prompt, create a skit modeling strategies to resist peer pressure to engage in risky behaviors, while saving face.	Perception of Peer Norms & Social Support for Healthy Behavior	45 min	Practice identifying and forming responses to peer pressures, "innoculating" participants to the strategies peers use to pressure them (Duryea, Ransom & English, 1990)

**Group Activities Summary Unit 3: Alcohol & Other Drugs**

Activity	Activity Description	Determinant(s)	Time Needed	Justification for Activity Targeting Determinant
Myth or Fact - Alcohol & Other Drugs	Divide into teams to compete identifying and explaining myths and facts. Then, in small groups, make posters to teach the truth about alcohol and other drug myths to other teens.	Knowledge of Alcohol & Other Drugs	45 min	Interact with and compete with knowledge introduced in the PlayForward videogame, increasing understanding of the consequences of risky and healthy actions and the value of those consequences (Borders, Earlywine & Huey, 2004; Mazis, Ahtola & Kippel, 1975).
Identifying & Removing Yourself from Risky Situations - Alcohol & Other Drugs	Group interactive vignette with decision points, reinforcing decision-making skills.	Self-Efficacy of Alcohol & Other Drugs	35 min	Repetitive practice of decision-making skills in a real-life context and identify potential barriers to healthy behavior, increasing self-efficacy (O'Leary, 1985).
Personal Reflection	Journal about who you would affect and how you would affect them if you started doing drugs or drinking.	Self-Efficacy and Perception of Peer Norms & Social Support for Healthy Behavior in Alcohol & Other Drugs	10 min	Increase feeling of social support and goals for future healthy behavior (Donaldson, Graham, Piccin & Hansen, 1995; O'Leary, 1985).
Refusal Skills Skit - Smoking in the Park	From a prompt, create a skit modeling strategies to resist peer pressure to engage in risky behaviors, while saving face.	Perception of Peer Norms and Social Support for Healthy Behavior of Alcohol & Other Drugs	45 min	Practice identifying and forming responses to peer pressures, "innoculating" participants to the strategies peers use to pressure them (Duryea, Ransom & English, 1990)

**Group Activities Summary Unit 4: Condoms and Other Barrier Protection**

Activity	Activity Description	Determinant(s)	Time Needed	Justification for Activity Targeting Determinant
Ranking Risky Behaviors	In groups, rank sexual activity cards from low risk to high risk. Then discuss how to reduce the risk involved in each activity and move cards accordingly. Conclude with discussion.	Knowledge	45 min	Interact with and discuss knowledge introduced in the PlayForward videogame, increasing understanding of the consequences of risky and healthy actions and the value of those consequences (Borders, Earlywine & Huey, 2004; Mazis, Ahtola & Kippel, 1975).
Practice Protection	Learn about STIs, condoms and dental dams in group discussion. Then practice using condoms.	Self-Efficacy	35 min	Repetition of a skill in a real-life context with their peers (O'Leary, 1985). Specifically targeting a particular behavior increases self-efficacy (DiClemente et al., 1996).
Personal Reflection	Journal about how your life would change if you or your partner got pregnant or if you got an STI. Who else would you affect and how?	Self-Efficacy; Perception of Peer Norms & Social Support for Healthy Behavior	10 min	Increase feeling of social support and goals for future healthy behavior (Donaldson, Graham, Piccin & Hansen, 1995; O'Leary, 1985).
Refusal Skills Skit - Condom Use	From a prompt, create a skit modeling strategies to resist peer pressure to engage in risky behaviors, while saving face.	Perception of Peer Norms & Social Support for Healthy Behavior	45 min	Practice identifying and forming responses to peer pressures, "innoculating" participants to the strategies peers use to pressure them (Duryea, Ransom & English, 1990)

## **Justification for Intervention Activities**

The following section will provide a summary of each of the types of activities used in the in-person group-based intervention, including a discussion of the activities' objectives and the determinants they target.

### *Myth or Fact*

In the Myth or Fact activities, participants are broken into two teams. Each team will take turns drawing statements about the unit topic out of a container. Teams must discuss the statement amongst themselves and decide whether it is a statement of fact or a myth. They will receive one point for deciding correctly and can earn a bonus point if they can explain why the statement is a fact or a myth. The competition format was adapted from an activity used by Advocates for Youth and the information used reinforces information presented during the iPad videogame mini-game, Knowledge Power, in which participants must win an argument against a computer character while saving face by using their knowledge about the risk topic and their wit (Advocates for Youth, 2008).

This activity targets participants' knowledge of risk and risk-reduction strategies as a determinant of age at sexual initiation, and use of alcohol and other drugs. Research has shown that the more active an activity is, the better participants will learn the information included (Michael, 2006). In addition, youth often lose interest and stop paying attention when information is presented in a lecture format. By engaging them in competition, this activity aims to elevate the participants' interest in the information presented. Gain-framed messages were used when possible to encourage participants to act on the information (Rothman & Salovey, 1997). Finally, this activity targets participants' misconceptions by identifying common myths about sexual activity and use of alcohol and other drugs and providing information to counter those myths (Hansen & Graham, 1991; Donaldson, Graham, Piccin & Hansen, 1995).

Expectancy-Value Theory states that a key aspect of predicting and changing someone's behavior is impacting their perception of the potential consequences of their actions (Borders, Earlywine & Huey). Adolescents are particularly influenced by the promise of immediate rewards and consequences and are less influenced by more distant consequences, so these distant consequences need particular emphasis (Casey, Jones & Hare, 2008). By impacting participants' knowledge about the risks involved in sexual and drug use behaviors, this activity aims to inform the value that participants place on the potential consequences of engaging in those behaviors.

To conclude the Myth or Fact activity for Unit 1: Risks in Sexual Activity, the facilitator will lead a discussion using the discussion questions provided. This will allow them to engage again with the information and solidify the takeaway messages of the activity.

To conclude the Myth or Fact activity for Unit 3: Alcohol and Other Drugs, participants will break into small groups and create posters. This will allow them to interact with the information in a more in-depth, creative way, and will combine the information with images to enhance learning and memory (Michael, 2006).

### *Identifying and Removing Yourself from Risky Situations*

In the Identifying and Removing Yourself from Risky Situations activities, participants read a vignette about a teen in a risky situation as a group. During the vignette, participants will face three decision points. At each decision point, the facilitator will lead discussion using the discussion points provided. Participants will be asked to help the main character of the vignette

make a decision about what to do next by (1) looking for clues that something risky might be going on or might happen soon, (2) identifying the choices available to the character, (3) identifying the possible consequences of each potential action, (4) evaluating how likely it is that each of those consequences will occur, (5) deciding which decision to make based on the possible consequences and their likelihood of happening, and (6) considering the potential barriers to the action they choose.

This activity targets participants' self-efficacy in identifying and removing themselves from risky situations involving sexual activity and the use of alcohol and other drugs by enhancing decision-making and reasoning skills. Expectancy-Value Theory posits that a key aspect of predicting and changing whether an individual will engage in a behavior is altering their perception of the potential outcomes (Borders, Earlywine & Huey, 2004). By impacting the value an individual places on each of the potential outcomes and their belief that an outcome will occur, one can impact their intention to engage in that behavior (Mazis, Ahtola & Kippel, 1975). At their stage of development, early adolescents are particularly influenced by immediate consequences and less influenced by distant consequences (Casey, Jones & Hare, 2008). The decision-making skills targeted in this activity aim to enhance participants' consideration of the potential outcomes and impact the value they place on consequences that occur in the farther in the future.

This activity reflects the skills in identifying and interpreting clues taught in the storylines in each level of the videogame. In addition, the decision-making skills that this activity draws upon reflect the skills gained in the Priority Sense mini-game of the videogame, in which participants must help a character boost their points in the two aspects of their lives that they are assigned (e.g. family, school, friends etc.) without letting other aspects fall below zero points, by selecting activities that will gain them points in one activity while assessing the risks they pose for losing points in other activities. The theory of self-efficacy and Inoculation Theory support repetitive the practice of a skill to enhance participants' belief in their ability to use that skill in the future (Bandura, 1998; Duryea, Ransom & English, 1990). A second key aspect of self-efficacy theory calls for skills to be practiced in the context in which they will be used (Bandura, 1998). This is particularly important for young adolescents as their stage of brain development makes them more susceptible to emotional and social contexts during decision-making (Steinberg, 2005). This activity allows youth to practice the skills that the videogame introduces to them in a more realistic context. They will be asked to make decisions and justify them with their peers, making them susceptible to similar pressures for social desirability as they would face in their real life. While no activity can completely replicate real-life contexts, in-person activities allow participants to take skills they have begun to learn in the videogame and practice them in a more realistic context.

### *How Much Trust?*

In the How Much Trust? Activity, participants will each receive a set of 10 flash cards with activities they might do with their significant other. They will be asked to approach the board and place their activities on an arrow. The beginning of the arrow will represent very little trust, while the end will represent a lot of trust. Participants will order their activities on the arrow according to how much trust they would want to have with their partner before doing each activity. Following this activity, the facilitator will engage participants in a discussion. Discussion will include questions about (1) why participants placed activities where they did, (2) the risks involved in each activity and how those risks affect the level of trust needed, (3) why

someone the participants' age might do these activities before they are ready and (4) ways to overcome the pressures that may cause someone the participants' age to do these activities before they are ready.

This activity targets participants' perception of social norms regarding sexual activity, by allowing them to engage with their peers about when they would and would not feel ready to do certain activities (Kohler, Behrman & Watkins, 2007). Participants will engage with their peers not only in discussion, but also during the time when they order their activities on the board. Their decisions will be subject to social pressures that reflect what is socially desirable in their real lives, which, as discussed before, is particularly important for young adolescents (Steinberg, 2005; Bandura, 1998). In addition, it builds their ability to resist negative peer norms by engaging with and planning for the barriers they may face to engaging in their ideal behaviors (Bandura, 1998). Secondly, this activity also aims to target self-efficacy regarding sexual activity by leading participants to assess the risk involved with particular activities, practicing this skill, and guiding them to consider what their limits are about sexual activity and what barriers they may face, before they are faced with those situations in their lives. This type of planning for the future and identifying potential barriers to desired behavior prior to encountering those situations is a key part of building self-efficacy for performing particular behaviors (Bandura, 1998).

### *Personal Reflection*

Personal Reflections are short writing prompts that participants will complete individually. Personal reflections are an opportunity for participants to think directly about how the information they are learning in the program may apply to their lives. Participants will be able to plan for their futures and think about how various risky activities could affect their lives and the lives of those who care about them or look up to them.

Personal reflections target participants' self-efficacy by planning for future activity, a key aspect of self-efficacy theory (Bandura, 1998). Secondly, personal reflections aim to target social support by encouraging participants to think about how their actions may affect the people who care about them or look up to them (Miller & Whitaker, 2001). For example, if participants start to use drugs, they may negatively impact their parents or become a bad influence to their younger siblings.

### *Understanding Sexual Risk*

In the Understanding Sexual Risk activity, participants will participate in an interactive simulation of the spread of STIs through the group. Some participants will have special instructions about what actions they may take, which will represent abstinence, condom use and number of sexual partners. The activity will conclude with a discussion about the risks of STIs and strategies for risk reduction.

This activity targets participants' knowledge of STI risks and strategies for risk reduction. As discussed above, Expectancy-Value Theory places great importance on changing individuals' perceptions of the value of potential outcomes of their behavior (Borders, Earlywine & Huey, 2004; Mazis, Ahtola & Kippel, 1975). This activity aims to increase the value that participants place on the potential outcomes of risky sexual behavior in order to impact their behavior. As discussed above, participants learn information better when they are actively engaged with it (Michael, 2006). The physical enactment of STI transmission and strategies for risk reduction aims to provide participants with an opportunity for experiential learning. Information about risk

reduction strategies will be gain-framed, by discussing the benefits of using the risk reduction strategies of abstinence, fewer partners and condom use to encourage the adoption of these strategies (Rothman & Salovey, 1997). The concluding discussion aims to reinforce takeaway points

### *Refusal Skills Skit*

In Refusal Skills Skit activities, participants will be asked to break into groups and create their own role plays for responding to pressure from peers while saving face. Each group will be given a worksheet with a prompt for their skit, including a background for their pressured situation and goals for their characters. Skits should include two to three ways of pressuring one teen, chosen from a list of types of strategies teens use to pressure others, as well as a response from the pressured teen to each pressure attack, using strategies for responding to pressure from a list on the worksheet. Each group will present their skit to the group. After each presentation, the facilitator will lead the group in determining what strategies for pressuring teens and what strategies for resisting pressure while saving face were used in the skit. The activity will conclude with the facilitator engaging participants in a discussion about what it felt like to be the teen being pressured and what it felt like to pressure other teens.

Strategies that teens use to pressure others and strategies that teens can use to resist pressure while saving face in this activity reflect the strategies employed in the Refusal Power mini-game in the videogame, in which participants must help a character identify the ways in which they are being pressured and employ strategies to resist that pressure. This activity aims to target resistance to overt and subtle peer pressure to engage in risky behaviors. When peer norms place subtle pressure on participants to engage in risky behaviors, they must be prepared to resist that pressure (Donaldson, Graham, Piccin & Hansen, 1995). This activity gives participants the opportunity to practice refusal skills within a social context that reflects their real lives by assigning them two goals, (1) resisting the pressure to engage in the risky behavior and (2) maintaining their relationship with the pressuring teen. By adding the second goal, this activity gives participants the opportunity to practice refusal skills within the bounds of more realistic social contexts. This activity draws on Inoculation theory, which states that individuals can in effect be ‘inoculated’ against future peer pressure by exposing them to the strategies and arguments that will be used to pressure them (Duryea, Ransom & English, 1990).

Planned skits were chosen instead of classic individual role plays to provide more opportunity oversight by facilitators and allow all participants to participate without. When role plays are used in a large group of adolescents without the opportunity for oversight by facilitators, they can quickly get off-track and youth may become squirrely. Small-group skits allow participants to thoroughly think through their decisions and plan together to resist peer pressure and allow for facilitator oversight. By working in groups, participants are also subject to similar social pressures that they may face in real life. As discussed earlier, young adolescents are particularly susceptible to social and emotional contexts, so mirroring those contexts when targeting resistance to unhealthy social norms is important (Steinberg, 2005).

### *Ranking Risky Behaviors*

In the Ranking Risky Behaviors activity, participants will be broken into small groups and each group will be given a large arrow (either drawn on a board or on a large sheet of poster paper). Each participant will be given a set of flash cards with sexual activities written on them. The beginning of the arrow will represent low risk and the end of the arrow will represent high

risk. Participants will be asked to rank their activities from lowest risk to highest risk by placing them along the arrow. Before beginning the ranking, the facilitator will review the meaning of the term “risk.” Participants will be encouraged to discuss what makes an activity risky with their group when deciding where to place their cards. After all groups have finished, the facilitator will choose one group’s arrow as an example for discussion and lead group discussion covering (1) observations about where activities were placed in different groups, (2) what risks are involved in each activity, (3) strategies for reducing the risk of that activity, and (4) moving the activities to their appropriate risk ranking when the risk reduction strategies are taken into account.

This activity aims to target participants knowledge about the risks involved in different pre-sexual and sexual activities and risk reduction strategies such as use of barrier protection. As discussed above, Expectancy-Value Theory places great importance on changing individuals’ perceptions of the value of potential outcomes of their behavior (Borders, Earlywine & Huey, 2004; Mazis, Ahtola & Kippel, 1975). As discussed above, participants learn information most effectively when an active learning strategy is employed (Michael, 2006). By allowing participants to engage with risk and risk-reduction information through small-group and facilitator-led discussion and physically move activity cards according to the activity’s riskiness, this activity aims to facilitate active learning of information about the risks of sexual activity and strategies for risk reduction.

### *Practice Protection*

In the Practice Protection activity, facilitators will lead an introductory discussion, introducing participants to the guidelines for correct condom use and introducing them to dental dams, while reinforcing their importance through a discussion of pregnancy and STI risk. Facilitators will demonstrate how to use a condom correctly before allowing participants to practice with their own condoms.

This activity aims to target participants’ self-efficacy for using barrier protection during sexual activities. At the core of self-efficacy theory is practicing skills to build participants’ confidence in their ability to use those skills in real life situations (Bandura, 1998). Practice Protection allows for direct practice of condom use skills and interaction with the guidelines for condom use, to build participants’ belief in their ability to access and use barrier protection during sexual activity.



## Evaluation of Group-Based Intervention Activities

### Further Development

The development of the group-based intervention will follow an iterative process. The current version of group-based activities is the initial iteration. The program model was developed from theory and research, with influence from initial focus groups from videogame development and the experience of research staff from the randomized controlled trial phase of videogame evaluation.

Focus groups will be conducted with youth program staff and youth, updating new iterations of the program in response to each group. A minimum of four focus groups with youth will be conducted, to cover a range of ages and opinions. One to two focus groups will be held with youth program staff. Fewer focus groups will be held with program staff due to their more limited numbers and time. Each focus group will consist of five to seven participants. At the conclusion of each focus group, each participant will receive a \$30 gift card to Target as a token of thanks for their participation.

The initial focus group guide for youth and program staff can be found in the Evaluation Materials section of this manual. Focus group guides will be updated after each focus group, incorporating feedback from themes in previous focus groups. Initial youth focus groups will focus on the concepts of the intervention activities as well as the language used and later focus groups will try out the activities to assess for feasibility.

### Evaluation Overview

The *PlayForward: Elm City Stories* group-based intervention is designed to be implemented in youth programs in conjunction with the *PlayForward: Elm City Stories* videogame. A pilot of the group-based intervention will be conducted in youth programs along with the videogame to evaluate the impact and process of the intervention. The evaluation of the impact will be used to assess the degree to which the program achieves its goal of reducing new HIV infections in racial and ethnic minority youth in the greater New Haven area. The evaluation of the process will be used to improve the feasibility of implementing the program for youth program staff and youth in the greater New Haven area. This section describes the plan for the evaluation of the process and impact of the *PlayForward* group-based intervention.

Table 5 outlines a timeline for the pilot program and evaluation. The group-based intervention pilot will be implemented during a summer cohort, in three different youth programs, recruited at the end of the spring cohort of the *PlayForward: Elm City Stories* videogame randomized controlled trial. Each program will include 10 to 25 youth and be directed by youth program staff with the oversight and support of research staff. Youth participation in the pilot program will be contingent upon written informed consent from a parent or guardian as well as informed assent from youth. All study procedures will be submitted to the Yale Human Investigation Committee for institutional review board approval prior to implementation.

<b>Table 5: Intervention &amp; Evaluation Timeline</b>							
	<b>Jun-14</b>	<b>Jul-14</b>	<b>Aug-14</b>	<b>Sep-14</b>	<b>Dec-14</b>	<b>Jun-15</b>	<b>Jun-16</b>
<b>Intervention</b>							
<b>Recruitment</b>	X						
<b>Intervention</b>		X	X				
<b>Process Evaluation</b>							
<b>Facilitator Evaluation</b>		X	X				
<b>Participant Evaluation</b>			X				
<b>Observer Evaluation</b>		X	X				
<b>Impact Evaluation</b>							
<b>Participant Assessments</b>	X	X	X	X	X	X	X

### **Impact Evaluation**

The impact of the *PlayForward: Elm City Stories* intervention will be assessed through periodic individual assessments of the youth participants. Assessments will evaluate each of the determinants and health behaviors as well as the primary outcome, new HIV infections. Assessments will be conducted at baseline (when participants are enrolled), 3 weeks, 6 weeks, 3 months, 6 months, 12 months, and 24 months, in keeping with the current videogame randomized controlled trial assessment points. The *PlayForward* intervention targets the pre-sexual age group (11-14). The two-year follow-up period allows assessments to capture the primary outcome, new HIV infections, as well as several of the intermediate health behaviors such as sexual initiation and alcohol and other drug use. Interim assessments help retain participants for future follow-up and provide a picture of the development of HIV health risk behaviors over a crucial period of youths' development.

Assessments will take place at the youth program sites for convenience and ease of access for participants. Assessments will be conducted by research staff in individual private rooms to minimize the effect of social desirability and increase participant's comfort in answering personal questions. The assessments are designed to take between 30 and 40 minutes. Due to varying reading levels of participants and to ensure that quality data are collected, assessments will be conducted in a one-on-one setting with research staff. Youth will be given a copy of the assessment to read along, and research staff will read through questions and answers with youth and enter them into the computer database on TrialDB. At the completion of each assessment, participants will receive a \$20-\$40 gift card to Target. Table 6 shows the timing for each section of the assessments. Not every section of the assessment will be delivered at each assessment time-point, depending on the information gathered.

<b>TABLE 6: Assessment Schedule</b>							
	Baseline	3 wks	6 wks	3 mos	6 mos	12 mos	24 mos
1) Demographics and Electronic Media Use	X						
2) Pre-sexual and Sexual Risk Behavior	X		X	X	X	X	X
3) Intentions, Attitudes, Norms and Self-Efficacy Related to Sex	X	X	X	X	X	X	X
4) Cigarette, Alcohol and Drug Use Behaviors	X		X	X	X	X	X
5) Self-Efficacy for Drug Use Resistance	X	X	X	X	X	X	X
6) Personal Limits and Risky Situations	X	X	X	X	X	X	X
7) Social Support	X						
8) Knowledge	X		X	X	X	X	X
9) Participant Experience		X	X				
10) Exposure to Other Resources	X		X	X	X	X	X
11) Bullying and Other Teen Dating Violence	X		X	X	X	X	X
12) Future Orientation	X	X	X	X	X	X	X
13) Health Screenings	X		X	X	X	X	X
14) School Violence	X	X	X	X	X	X	X
15) School Orientation	X	X	X	X	X	X	X

The analysis of data collected will evaluate changes in each determinant and health behavior, as well as the primary outcome of new HIV infections. Success of the intervention will be measured by comparing the intervention group's outcomes with the control and videogame-only groups. Determination of success of the intervention will be primarily based upon the magnitude of the effect size. Based on an examination of other interventions, a small to moderate effect size (OR of 1.5-3.5) can be considered a successful change in the intervention group (Lawrence et al., 1995; Jemmott, Jemmott & Fong, 1998; Stanton et al., 1996). For example, a study of the effect of an abstinence-based intervention and a safer sex-based intervention on HIV risk in African American adolescents found that at 3-month follow-up, adolescents in the control group were 1.22 times more likely to report having sexual intercourse than abstinence intervention groups (OR 2.22, 95% CI 1.16, 4.35). This difference was not maintained at 6- and 12-month follow-up. Adolescents in the safer-sex intervention group were 2.28 times more likely to report consistent condom use than the control group (OR 2.38, 95% CI 1.25-9.16) and 2.10 times more likely to report consistent condom use than the abstinence group (OR 3.10, 95% CI 0.99-9.73) at 3-month follow-up (Jemmott, Jemmott & Fong, 1998). Similarly, a study of the effect of an AIDS prevention program for low-income African American youths found that the intervention group was significantly more likely to report condom use than the control group at

6-month follow-up (Mean, SD Control 19, 61; Mean SD Intervention 34, 85) but the effects were lost by 12-months (Stanton et al., 1996).

### *Treatment Groups*

The impact evaluation will compare three treatment groups. It will draw from the sample collected in the randomized controlled trial phase of the videogame evaluation for two different control groups. The first group will be a time-control group, who will play store-bought iPad videogames for a time equal to the time needed to play the *PlayForward: Elm City Stories* videogame (roughly 12 hours over a 6 to 8 week period). The second group from the randomized controlled trial will receive the *PlayForward: Elm City Stories* videogame intervention, with no group-based intervention. These groups were randomly assigned to individual participants through a computer randomization scheme. The randomized controlled trial will include roughly 330 participants, with roughly half of participants in each treatment group, to be completed in the current spring cohort, which will end in June.

The third treatment group will be the full intervention group, receiving the videogame intervention with the group-based activities. While the control groups were randomly assigned to individual participants, for feasibility, the group-based intervention will not be randomly assigned. The full intervention group will receive the pilot intervention during the summer cohort at three youth program sites. Each program will include 10 to 25 youth and be directed by youth program staff with the oversight and support of research staff.

### *Measures*

The measures used for each determinant, health behavior and outcome in the model are described in this section. Each assessment section can be found in the Evaluation Materials section below. Additional assessment sections are included in the evaluation materials section, such as Assessment 14, which pertains to school-based violence. These assessments do not pertain to the evaluation of the group-based intervention, but will be included in the assessments that participants receive for the purpose of other projects. All assessments were selected and adapted by the interdisciplinary play2PREVENT research team, which includes experts on HIV/AIDS, developmental psychology, statistics and data management, among others.

#### *Section 1—Demographics and Media Use*

Section 1 assesses demographics and media use through 30 questions. Ten items assess demographics about the participant, their family, their education and their sexual attraction preferences. For example, questions assess their age, gender, family composition, and typical grades. Twenty items assess common media use, such as frequency of use of cell phones, tablets and videogames. These questions will be used for pilot research for the videogame portion of the intervention. This assessment will be given at baseline.

#### *Section 2—Pre-Sexual and Sexual Behaviors*

Section 2 assesses pre-sexual (i.e. relationships, kissing, touching) and sexual behaviors (i.e. oral, vaginal and anal sex and condom use) through 41 items. These items were adapted by experts in the field of HIV/AIDS and developmental psychology, from previous research assessing sexual risk behaviors among adolescents (Tortolero et al., 2010) and from the CDC's Middle School Youth Risk Behavior Surveillance System (YRBSS), a validated measure that monitors six categories of priority health risk behaviors among youth and young adults (Brener

et al., 2013). Tortolero et al. assessed validity and reliability of the measure through extensive piloting of the measure with urban middle school populations. In addition the measure's predictive validity was confirmed through the measure's success in predicting the expected outcomes of sexual and pre-sexual activity in intervention and control groups (2010). The CDC's YRBSS has been tested for reliability through two test-retest studies, conducted in 1992 and 2000 in 7<sup>th</sup>-12<sup>th</sup> grade students, with low reliability questions being removed (Brener et al., 2013). In addition, in 2003, the CDC assess the validity of the measures by conducting an extensive review of empiric literature to assess the cognitive and situational factors that may affect the validity of adolescent self-report of the risk behaviors the YRBSS measures (Brener et al., 2013). The validity of the adapted measure was assessed by experts in the field of HIV/AIDS and developmental psychology, including principal investigator, Dr. Lynn Fiellin and other members of the play2PREVENT research group. Reliability of the adapted measure will be assessed through calculation of the Cronbach's alpha when data collection is complete.

Section 2 will collect self-report data on (1) initiation of each sexual risk behavior, (2) frequency of the behavior, (3) number of partners, (4) degree of forethought before initiating each behavior, (5) use of contraceptives and STI protection, (6) frequency that these behaviors occurred in conjunction with other sexual risk behaviors, such as use of alcohol and other drugs.

### *Section 3—Intentions, Attitudes, Norms and Self-Efficacy Related to Sex and Condom Use*

Section 3 assesses the psychosocial variables, intentions, attitudes, norms and self-efficacy of condom use and sexual refusal through 44 items. Items from Section 3 were taken from the Tolero et al. sexual behavior intervention assessment for an urban middle school population (2010). Reliability and validity of this measure is discussed above, in Section 2.

*Intentions.* Section 3 includes 5 items assessing participants' intentions to have oral, anal, or vaginal sex in the next year, as well as their intention to be abstinent in the next year and their intention to use a condom if they did have sex in the next 3 months.

*Decisional Balance.* Section 3 will assess participants' reasoning in deciding to have sex or not have sex through two items. One item will provide participants with 8 reasons not to have sex now and the other will present them with 9 reasons to have sex now, and will be instructed to select all that apply to them.

*Perceived Norms about Sex, Relationships and Condom Use.* Section 3 will assess participants' perceived attitudes of friends toward sexual behaviors and condom use through 7 items. An additional 4 items will assess participants' perception of friends' actual sexual behaviors.

*Self-Efficacy Related to Condom Use and Sexual Refusal.* Section 3 will assess self-efficacy to refuse sexual behaviors through 7 items, in which participants will be presented with a situation and asked how confident they are that they could refuse various sexual behaviors. Self-efficacy of condom use will be assessed through 5 items asking participants how confident they are that they could obtain and use a condom correctly.

*Attitudes Towards Condom Use.* Section 3 will assess attitudes towards condom use through 3 items relating to participants beliefs about condom use.

*Perceived Susceptibility for STIs.* Section 3 will assess participants' perceived risk of contracting STIs, including HIV, with 4 items.

#### *Section 4—Cigarette, Alcohol and Drug Use Behaviors*

Section 4 assesses participants' use of cigarettes, alcohol and other drugs through 20 items asking about lifetime use as well as use in the past 30 days. This measure comes directly from the CDC Middle School YRBSS, which has been validated to collect self-report data on the use of cigarettes, alcohol, marijuana, cocaine, inhalants, over-the-counter drugs, prescription drugs and methamphetamines in middle school populations (Brener et al., 2013).

#### *Section 5—Self-Efficacy of Drug Use Resistance*

Section 5 assesses participants' self-efficacy for refusing drug use through 10 items adapted from the Drug Use Resistance Self-Efficacy (DRUSE) Scale for Young Adolescents (Carpenter & Howard, 2009). The DRUSE Scale developed through an extensive literature review, expert panel review of scale items, adolescent focus groups and pilot testing of preliminary items, and was tested for psychometric properties in a sample of 7<sup>th</sup> grade students and factor analysis was conducted (Carpenter & Howard, 2009). Reliability was very high for DURSE subscales and the total scale (Cronbach's alpha for alcohol, cigarettes, marijuana and total score, respectively, 0.95, 0.97, 0.98, 0.98). Construct validity was good, as evidenced by the DURSE scales' ability to distinctly measure drug use and resistance self-efficacy and the production of expected predictive results in the association between resistance and self-efficacy beliefs and academic grades, lower intentions to use drugs and alcohol and lower rates of family drug use (Carpenter & Howard, 2009). Two items are assessed for each cigarettes, alcohol, marijuana and prescription drugs, assessing participants' self-efficacy for saying no when they are offered by a friend and an older friend or family member. In addition, one item each assesses participants' self-efficacy for refusing to drive after drinking and refusing to buy drugs when asked by someone they know.

#### *Section 6—Personal Limits and Risky Situations*

Section 6 assesses participants' frequency of encountering risky situations like riding in a car with someone who has been drinking or being alone kissing or touching someone they are attracted to through 5 items, from the previously discussed Tortolero et al. study (2010).

#### *Section 7—Social Support*

Section 7 will assess participants' perceptions of the availability of social support through 10 items employed in the Tortolero et al. study discussed previously (2010). Each item asks how helpful various persons are with respect to providing personal support.

#### *Section 8—Knowledge*

Section 8 assesses participants' knowledge about HIV/AIDS, STIs, drug use and risk behavior knowledge through 22 True or False items. Items draw upon knowledge that has been adapted from several adolescent knowledge content sources, including an evidence based curriculum that has been successful in reducing STI's and teen pregnancy in young racial and ethnic minority adolescents (Jemott, Jemott & McCaffree, 2011) and [www.kidshealth.org](http://www.kidshealth.org), a website created by the Nemours Center for Children's Health Media, a part of The Nemours Foundation, which is a nonprofit organization devoted to improving the health of children.

### *Section 9—Participant Experience*

Section 9 assesses participants' experiences with the intervention. It will be discussed in the process evaluation section below.

### *Section 10—Exposure to Other Resources*

Section 10 assesses whether participants have been exposed to other resources before the intervention through 6 items, which ask about programs or classes participants have taken part in about HIV/AIDS, other STIs and pregnancy as well as additional resources participants may have used (e.g. the internet, family members, teachers).

### *Section 12—Future Orientation*

Section 12 assesses participants' perceptions about their ability to make decisions and orientation towards the future through 8 items. Perception of decision-making abilities will be assessed through 5 items asking participants how they feel their decisions will affect them immediately, in one month, in one year, and in 20 years. Three items will be used to assess how participants perceive their future.

### *Section 13—Health Screenings*

Section 13 assesses participants' health screening behaviors and self-reported STI and pregnancies. Seven items will be used assessing whether participants have been tested for HIV, other STIs or pregnancy (for female participants) and if yes, what the results of those tests were.

## **Process Evaluation**

The intervention process will be evaluated during the pilot phase of the group-based intervention. This component of evaluation will assess the implementation and feasibility of the intervention. The results of this evaluation will be used to better understand the impact evaluation results and will be used to improve the intervention program beyond the pilot phase. The process evaluation will use qualitative and quantitative measures to evaluate the program reach, fidelity, dose delivered, dose received, and implementation quality.

### *Reach*

The reach of the program will be evaluated by calculating the number of youth of eligible age (11-14) in each of the three summer programs, and dividing that number by the number of youth who enroll in the program. Before they may enroll, youth must give written assent to participate and return a permission form with written consent from a parent or guardian. This reach measure will indicate the degree of success of marketing the program to youth and parents as well as the perceived relevance of the intervention to the youth population.

### *Fidelity*

The fidelity of the delivered interventions to the intended delivery of the intervention will be measured by an assessment conducted by research staff observers of each youth program. The assessment will include any deviations from the expected activities, any additional activities or explanations that occur and how much time each activity took to complete. It will be stressed to program staff that research staff observers are a tool for improving the intervention and assessing

the results of the intervention, and are not a punitive measure. Research staff will complete Evaluation Form C: *PlayForward: Elm City Stories* Activity Observation during their observation.

#### *Dose Delivered and Dose Received*

The dose of the intervention delivered measures the amount of time actually spent on the intervention and its activity components. This will be measured by research staff observers, who will record the time at which each activity was started and concluded.

The dose of the intervention received measures the amount of time that each participant spends doing intervention activities. This will be measured by youth program staff facilitators who will be asked to take attendance at each activity and note if any participants leave the activity early. For instance, if a participant is picked up early from the youth program, the time that they left should be noted in the attendance chart.

Attendance does not necessarily indicate engagement, so to more fully capture participant engagement, feedback will be collected on the individual level through participant evaluations of the program conducted during the 6-Week assessment, and at the group level, through the feedback of the youth program staff facilitator in the activity feedback form.

#### *Implementation*

As a pilot program it will be essential to assess the implementation of the intervention to incorporate feedback to improve future implementation. The implementation of the intervention will be assessed with mixed methods through 1) participant feedback after the intervention 2) youth program staff feedback after each activity and 3) research staff observer feedback after each activity.

At the 6-Week assessment, after the intervention has been delivered, participants will be administered Assessment Form 9B, which assesses the degree to which activities engaged participants, problems the participants perceived with the implementation of activities and the performance of youth program staff facilitators. [See Evaluation Materials, Assessment 9B].

After each activity, youth program staff facilitators will be asked to fill out a short feedback form. The feedback form, Form D: *PlayForward: Elm City Stories* Intervention Activity Feedback, will ask whether anything occurred that may have affected the way the activities were conducted or received, as well as which parts of the activity went well and which parts were challenging or went poorly and why.

Finally, during the activity, research staff observers will make observations about anything that may have affected the way the activities were conducted or received, for instance, if the room was quite hot, or if participants received snacks during the activity. They will be asked to record what portions of each activity went well and which went poorly and why. Finally, they will be asked to record whether any additions or subtractions were made to the activities and how those additions or subtractions appeared to affect implementation. For example, did the facilitator give additional instructions that help clarify an activity?



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## Appendix A: Model Determinants Tables

**Model Determinant Table 1: Knowledge**

Determinant (Study)	Strength of Association	Changability	Population	Determinant of Which Behavior
Not Knowing Someone with AIDS (Rickman et al., 1994)	OR = 2.3; Adjusted OR =1.8 (95% CI 1.3-2.4)	High (Rothman & Salovey, 1997)	Incarcerated Adolescents	Condom Non-Use
Knowledge of HIV/AIDS Risk (Romer et al., 1994)	Association not significant	High (Rothman & Salovey, 1997)	A-A 9-15 y-o, public housing residents	Condom Use
Knowledge of HIV/AIDS Risk (Romer et al., 1994)	Association not significant	High (Rothman & Salovey, 1997)	A-A 9-15 y-o, public housing residents	Sexual Activity/Initiation
HIV Knowledge (Bachanas et al., 2002)	r = 0.03 (None)	High (Rothman & Salovey, 1997)	Minority Young Teens 12-15 y-o	Age at Sexual Initiation
HIV Knowledge (Bachanas et al., 2002)	r = 0.04 (None)	High (Rothman & Salovey, 1997)	Minority Young Teens 12-15 y-o	# Partners in Last 60 Days
HIV Knowledge (Bachanas et al., 2002)	r = 0.05 (None)	High (Rothman & Salovey, 1997)	Minority Young Teens 12-15 y-o	STD History
HIV Knowledge (Bachanas et al., 2002)	r = 0.21 (Low)	High (Rothman & Salovey, 1997)	Minority Young Teens 12-15 y-o	Pregnancy History
HIV Knowledge (Bachanas et al., 2002)	r = -0.33 (Moderate)	High (Rothman & Salovey, 1997)	Minority Young Teens 12-15 y-o	Condom Frequency

**Model Determinant Table 2: Peer Norms**

Determinant (Study)	Strength of Association	Changability	Population	Determinant of Which Behavior
Perception of Peer Sexual Behavior (Sex & Condom Use)(Romer et al., 1994)	Association significant	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	A-A 9-15 y-o, public housing residents	Sexual Activity/Initiation
Perception of Peer Sexual Behavior (Sex & Condom Use) (Romer et al., 1994)	Association significant	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	A-A 9-15 y-o, public housing residents	Condom Use
Peer Norms (Bachanas et al., 2002)	r = 0.09 (None)	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	Minority Young Teens 12-15 y-o	Age at Sexual Initiation
Peer Norms (Bachanas et al., 2002)	r = 0.27 (Small-Moderate)	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	Minority Young Teens 12-15 y-o	# Partners in Last 60 Days
Peer Norms (Bachanas et al., 2002)	r = 0.34 (Moderate)	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	Minority Young Teens 12-15 y-o	STD History
Peer Norms (Bachanas et al., 2002)	r = -0.07 (None) younger teens; r = -0.34 (Moderate-High) Older teens	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	Minority Young Teens 12-15 y-o; Minority Older Teens 16-19 y-o	Condom Frequency
Perceived Peer Norms as Supporting Condom Use	OR = 4.2 (High)	Moderate-High (Donaldson, Graham, Piccin & Hansen, 1995; Neighbors, Larimer & Lewis, 2004; Berkowitz, 2004; Perkins & Craig, 2006)	A-A adolescents & young adults 12-21 through street outreach in San Francisco	Consistent Condom Use

**Model Determinants Table 3: Self-Efficacy**

<b>Determinant (Study)</b>	<b>Strength of Association</b>	<b>Changability</b>	<b>Population</b>	<b>Determinant of Which Behavior</b>
Sexual Self-Efficacy (Bachanas et al., 2002)	r = 0.31 (Moderate)	High (Fischhoff, Crowell & Kipke, 1999; Jemott, Jemott & Fong, 1998; St. Lawrence et al., 1995; Epstein, Griffin & Botvin, 2000)	Minority Young Teens 12-15 y-o	Age at Sexual Initiation
Sexual Self-Efficacy (Bachanas et al., 2002)	r = -0.25 (Small-Moderate)	High (Fischhoff, Crowell & Kipke, 1999; Jemott, Jemott & Fong, 1998; St. Lawrence et al., 1995; Epstein, Griffin & Botvin, 2000)	Minority Young Teens 12-15 y-o	# Partners in Last 60 Days
Sexual Self-Efficacy (Bachanas et al., 2002)	r = -0.18 (Small)	High (Fischhoff, Crowell & Kipke, 1999; Jemott, Jemott & Fong, 1998; St. Lawrence et al., 1995; Epstein, Griffin & Botvin, 2000)	Minority Young Teens 12-15 y-o	STD History
Sexual Self-Efficacy (Bachanas et al., 2002)	r = 0.05 (None)	High (Fischhoff, Crowell & Kipke, 1999; Jemott, Jemott & Fong, 1998; St. Lawrence et al., 1995; Epstein, Griffin & Botvin, 2000)	Minority Young Teens 12-15 y-o	Condom Frequency
Assertive Self-Efficacy to Demand Condom Use (DiClemente et al., 1996)	OR = 11 (Large)	High (Fischhoff, Crowell & Kipke, 1999; Jemott, Jemott & Fong, 1998; St. Lawrence et al., 1995; Epstein, Griffin & Botvin, 2000)	A-A adolescents & young adults 12-21	Consistent Condom Use

**Model Determinant Table 4: Use of Alcohol & Other Drugs**

<b>Determinant (Study)</b>	<b>Strength of Association</b>	<b>Changability</b>	<b>Population</b>	<b>Determinant of Which Behavior</b>
Substance Use (Bachanas et al., 2002)	r = -0.22 (Small)	Moderate (Tobler et al., 2000)	Minority Young Teens 12-15 y-o	Age at Sexual Initiation
Substance Use (Bachanas et al., 2002)	r = 0.34 (Moderate)	Moderate (Tobler et al., 2000)	Minority Young Teens 12-15 y-o	# Partners in Last 60 Days
Substance Use (Bachanas et al., 2002)	r = 0.66 (High)	Moderate (Tobler et al., 2000)	Minority Young Teens 12-15 y-o	STD History
Substance Use (Bachanas et al., 2002)	r = 0.41 (High)	Moderate (Tobler et al., 2000)	Minority Young Teens 12-15 y-o	Pregnancy History
Substance Use (Bachanas et al., 2002)	r = -0.39 (High)	Moderate (Tobler et al., 2000)	Minority Young Teens 12-15 y-o	Condom Frequency