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Conceptual Models to Depict the Factors that Influence the Avoidance and Cessation of Sexual Risk Behaviors Among Youth

This brief was developed as part of a portfolio of youth-focused projects on sexual risk avoidance and cessation sponsored by the U.S. Department of Health and Human Services. The brief presents two initial, complementary conceptual models—one for sexual risk avoidance and a second for sexual risk cessation—that aim to guide efforts to prevent youth risk behaviors and promote optimal health. The models identify a range of factors that research shows may influence youth decision making, sexual behavior, and related outcomes. These influencing factors occur at the environmental, interpersonal, or individual level, and many can be modified through intervention. To this end, the models may be used to guide and support efforts to develop and refine programs, tailor educational messages to youth, and empower parents and other adults to help youth avoid or cease sexual and non-sexual risk behaviors. In particular, the sexual risk cessation conceptual model is supporting the development of a sexual risk cessation program model and related supplemental curriculum module, intended to help sexually-experienced youth avoid sexual activity in the future.

Policymakers and practitioners are interested in identifying strategies and approaches to empower youth to make informed decisions that promote optimal health. Such decisions include the avoidance and cessation of sexual risk. Strategies aimed at encouraging sexual risk avoidance and sexual risk cessation are intended to help teens avoid or discontinue sexual activity and contribute to their overall health and personal development. For purposes of this brief sexual activity encompasses consensual activities that youth engage in that are sexual in nature, primarily including but not limited to intercourse.

Identifying the factors that influence youth's decisions to avoid or cease sexual activity can support policymakers, practitioners, and public health officials as they develop programming and policy to improve risk-related outcomes. The primary behavioral outcomes related to sexual risk avoidance and cessation differ to reflect the developmental context of youth. For example, a delay in sexual initiation is one of the most common outcomes for sexual risk avoidance, since it is relevant to sexually-inexperienced youth. In contrast, a reduction in recent sexual intercourse is a common outcome cited in the

literature for sexual risk cessation due to its relevance to sexually-experienced youth. It may reflect an incremental step toward the avoidance of future risk. Other relevant outcomes include non-behavioral outcomes, such as attitudes, skills, and intentions toward sexual activity. These typically occur in the short-term and can also act as influencing factors on behavioral outcomes. Non-sexual behavioral outcomes are also relevant, including, for example, depression or anxiety, alcohol or substance use, and academic achievement. Finally, longer-term outcomes of sexual activity include pregnancy and sexually-transmitted infections.

Mathematica developed two complementary conceptual models that use graphical illustrations and supporting narrative to depict the factors that influence behavioral outcomes related to sexual risk avoidance and sexual risk cessation among youth. This work is sponsored by the Office of the Assistant Secretary for Health (OASH) at the U.S. Department of Health and Human Services and overseen by the Administration for Children and Families' Office of Planning, Research, and Evaluation (OPRE).

The conceptual models are based on an in-depth, targeted literature review of the empirical and theoretical literature to identify specific factors that influence outcomes related to sexual risk avoidance and cessation among youth. The development of the models was also informed by discussions with eight experts from across the fields of youth sexual risk prevention programming, developmental psychology, and health behavior research. The models depict factors that influence focal outcomes but are not designed to assess the effectiveness of particular programs or program components.

In this brief, we present the initial conceptual models, which will be refined over time, and the methods used to develop them. First, we discuss the social ecological model, the framework used to organize the factors identified as influential for sexual risk avoidance or sexual risk cessation (Bronfenbrenner 1977). Then, we discuss the two conceptual models: (1) the sexual risk avoidance model, which applies to youth who have not yet had sex, and (2) the sexual risk cessation model, which applies to youth who have already had sex. Next, we discuss key limitations of these conceptual models. Finally, we highlight ongoing research and analyses that will support further development and refinement of the models.

Key definitions

Sexual risk avoidance: Not engaging in consensual sexual activity.

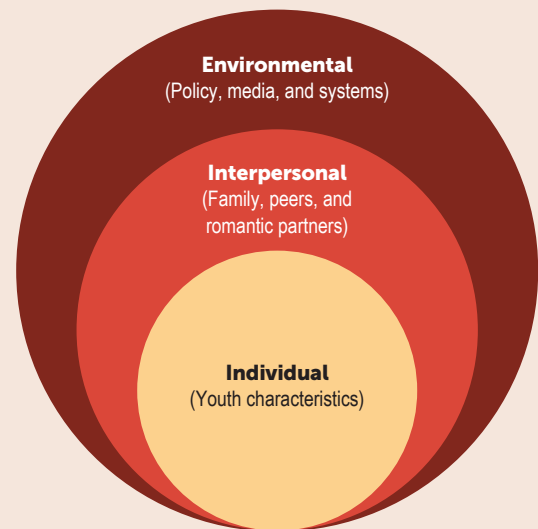
Sexual risk cessation: Discontinuing consensual sexual activity after having engaged in it.

Conceptual model: A representation of the factors that influence key outcomes of interest.

A framework for examining influences on youth sexual behaviors

Multiple factors affect whether (and when) youth engage in consensual sexual intercourse and other sexual activities.¹ These factors can influence youth and their decisions long before an unintended pregnancy or other undesired outcome occurs. Factors influencing sexual risk avoidance and cessation outcomes occur at multiple levels—from a person's environment to his or her interpersonal relationships and individual characteristics. To reflect how factors at different levels influence behavior, we used the social ecological model to organize factors according to their level of influence on sexual risk avoidance and sexual risk cessation (Bronfenbrenner 1977) (Figure 1).

Figure 1. Social Ecological Model



Note: Adapted from Bronfenbrenner 1977.

Although we used this model as the organizing framework, the conceptual models described below also draw on elements of other theoretical models—such as theories of self-determination, attachment, positive youth development, self-regulation, and the life course (Ryan and Deci 2000, Leventhal et al. 2016, Waters et al. 2000, Benson et al. 2007, Hutchinson 2011).

The social ecological model considers factors at multiple levels and interactions among factors within and across levels. The levels are organized from the most distal factors within the environmental level (which are less likely to have an immediate effect on youth behavior) to more proximal factors within the interpersonal and individual levels (which can have a more immediate influence on youth behavior). Related factors are grouped into categories, such as media or peers, at each level. These influencing factors, alone and in combination, lead to various sexual health and related outcomes.

Next, we present the sexual risk avoidance and sexual risk cessation conceptual models, and discuss selected influencing factors within each model and how they relate to key outcomes. A full depiction of the factors influencing outcomes for sexual risk avoidance and cessation can be found in Figures 2 and 3. The conclusions presented in the narrative that follows represent a synthesis of the findings from across the 88 articles included in the literature review (see the box on the next page for a description of the methods used to review literature and identify factors). In Tables A.1, A.2, and A.3 at the end of the brief we indicate which articles contributed to the evidence for each factor category.

¹The definition of sexual intercourse varied in the literature, but primarily referenced vaginal intercourse. Therefore, for purposes of this brief it refers to vaginal intercourse unless otherwise specified.

Each conceptual model includes a set of outcomes that reflect the behavioral context for the target population of youth. The outcomes in each model differ. The sexual risk avoidance model focuses on outcomes for sexually inexperienced youth related to delay of sexual initiation. The sexual risk cessation model focuses on outcomes for sexually experienced youth related to the discontinuation of sexual activity. Within each model, there are outcomes focused on beliefs and intentions regarding sexual behavior; sexual behaviors, including initiation of sexual intercourse for sexual risk avoidance and recent sexual intercourse for sexual risk cessation; non-sexual behavioral outcomes, such as academic achievement and mental health; and health status outcomes of pregnancy and sexually transmitted infections. The conceptual models include only those factors with empirical evidence linking them to these outcomes.

The conceptual models also indicate factors that may be modified by intervention. These are factors that practitioners, such as schools and community organizations, or individuals, such as parents or peers, might be able to change through a program or other intervention. Program developers and staff might focus on the modifiable influencing factors when designing and improving program interventions.

A guide to the conceptual model figures

- The conceptual model figures display factors identified as influential on at least one of the key outcomes for sexually inexperienced youth (sexual risk avoidance) or sexually experienced youth (sexual risk cessation).
- Factors are marked as a protective factor or a risk factor based on whether the evidence showed that it was a positive (protective) influence (+) on the intended outcomes or a negative (risky) influence (-).
- Factors that practitioners, such as schools and community organizations, or individuals such as parents, might be most able to change or modify through intervention are marked with an “M” for “modifiable factor.”
- Factors may interact with each other to influence outcomes although the interaction is not depicted in the figures.

Sexual risk avoidance conceptual model

Factors at the environmental, interpersonal, and individual levels influence decisions among sexually inexperienced youth to not engage in sexual activity (sexual risk avoidance). These factors, along with outcomes related to sexual risk avoidance, are displayed in the conceptual model in Figure 2. The identified factors have been shown to be associated with outcomes related to sexual risk avoidance, such as beliefs and intentions to avoid sexual activity; engagement in precoital behaviors, for example, touching another person under his or her clothes; or the initiation of sexual intercourse. The relationships between the factors and outcomes are represented in the conceptual model figure. In this section, we discuss how the identified factors influence sexual risk avoidance outcomes.

Environmental factors. Media, neighborhood characteristics, and policy influence sexual risk avoidance at the environmental level. As identified in the literature, exposure to sexually explicit media through the Internet, TV, and movies emerged as a risk factor for sexual initiation, increased sexual activity, and increased permissive attitudes about sex during adolescence. In particular, exposure to Internet pornography was associated with permissive sexual attitudes. Living in an unsafe community or a high-poverty neighborhood was associated with early sexual initiation. The reviewed literature also suggested that sexual health education programs can, but do not always, help delay sexual initiation. It was beyond the scope of this review to examine the relative effectiveness of different types of programs or program content on key behavioral outcomes.

Interpersonal factors—families, peers, and partners. Relationships with family members and family structure represent some of the most cited interpersonal influences on youth sexual initiation, especially for younger youth. Positive family relationships, higher socioeconomic status, and higher parental educational attainment played a protective role for initiation of sexual activity among youth. Connectedness to parents through family routines and emotional bonds were protective factors for cognitive susceptibility to initiate sex— i.e., personal readiness for the onset of sex and having high expectations that it will occur — and consequent initiation of sex. Similarly, parental monitoring, as reflected in the number of weekly hours youth do not spend alone at home, and parental values that disapprove of adolescent sex were both protective factors for early initiation of sex. Research also suggested that when parents communicate with adolescents about relationships, sex, and condom use before they become sexually active,

Literature review and analysis methods

To develop the conceptual models, we identified, reviewed, and assessed literature that provided evidence for whether specific factors influenced outcomes related to sexual risk avoidance and sexual risk cessation. The key steps in our process were:

- **Identifying relevant literature.** Using a set of parameters and search terms to identify articles focused on youth sexual activity and related decision making, we searched a wide range of academic databases, as well as select websites. We searched for articles that reflected varied analytic approaches and perspectives, including quantitative studies (e.g., randomized controlled trials and longitudinal studies) and qualitative studies (e.g., literature reviews and analyses of qualitative data). Overall, we identified almost 1,000 articles, including 750 peer-reviewed academic articles and 250 from the grey literature (e.g., policy papers and research briefs).
- **Screening articles for potential review.** We reviewed abstracts for each identified article to assess whether the article met at least four of five criteria. This process narrowed the number of articles to 248 that we considered for a full review. The screening criteria were:
 1. Relevant target population (youth and young adults ages 13 to 24)
 2. Relevant to the development of the conceptual models, having one or more of these features:
 - a. Focused on key behavioral outcome(s), such as sexual avoidance or abstinence, sexual delay, reduction in sexual activity, and sexual risk cessation
 - b. Focused on factors, decision-making process, and/or skills related to key outcomes
 - c. Discussed behavior change theory (or theories) relevant for sexual risk behavior
 - d. Examined public health campaigns or messaging related to sexual and other risk behaviors
 3. Focused on a U.S. population
 4. Published in peer-reviewed journal (from 2003 to the first quarter of 2018) or underwent a rigorous quality review (e.g. government reports)
 5. Adhered to scientifically based research standards—that is, “standards that apply rigorous, systematic, and objective methodology to obtain reliable and valid knowledge and present findings and make claims that are appropriate to and supported by the methods employed.” (These research standards are articulated in the Education Sciences Reform Act of 2002 [PL 107-279, Sec 102]).
- **Selecting articles for in-depth review.** We prioritized 88 of the 248 articles for review, selecting those that, in addition to the above criteria, also (1) had a sample size larger than 200, (2) were generalizable to a national context, and (3) discussed multiple factors and outcomes of interest.
- **In-depth review and abstraction.** We conducted in-depth reviews of the 88 articles, abstracting a detailed set of information from each one. The citation for each of the 88 articles is provided in the Reference List (Section A) at the end of the brief.
- **Analysis process.** We followed four key steps to identify influential factors for inclusion in the models:
 1. Assessed the relevance and rigor of each article. Using a defined set of criteria that accounted for the range of analytical approaches in the reviewed literature, we used a decision process to separately assess quantitative and qualitative articles. We assigned a quality of evidence rating to each article using a 5-point scale: Very High (5), High (4), Moderate (3), Low (2), and Very Low (1). Our rating protocol gave greater weight to quantitative studies with rigorous research designs.
 2. Assigned an evidence rating score to each factor. We identified a list of factors that each article examined as potentially influencing, associated, or correlated with a sexual risk avoidance or sexual risk cessation behavioral outcome (56 factors across 88 articles). We assigned each factor the rating score from the article that examined it. If a factor was examined in multiple articles, we calculated the average rating across relevant articles to determine the score.
 3. Reviewed and synthesized the evidence for factors. We established a quality rating cutoff, which was one standard deviation (0.48) below the average rating for all factors (2.83). For each factor that met the cutoff, we examined the presence of an effect or association between the factor and outcomes.
 4. Incorporated factors with evidence into the models. The factor review and synthesis process identified 38 distinct factors for inclusion in the conceptual models (36 for sexual risk avoidance and 20 for sexual risk cessation). We categorized each factor within the levels represented in the social ecological model (environmental, interpersonal, or individual); the directionality of the influence (whether it was protective or risky in relation to the outcome[s]); and variation for subgroups (e.g. gender, race/ethnicity, or age).

adolescents may be more likely to delay sexual activity. Although the specific content of such conversations was not measured in the reviewed research, findings showed that communication with parents about sexuality can serve as a protective factor for sexual initiation.

Youth make social comparisons during their decision-making processes, and peers play a crucial role, particularly in terms of sexual intentions and behaviors. Risky peer behavior, such as alcohol and drug use, and permissive sexual norms and behaviors among peers in youth's social network were related to initiation of sexual activity. Also, having a greater proportion of friends with sexual experience was associated with higher risk of sexual debut. In contrast, having positive peer role models, such as friends who exhibit healthy behaviors, was a protective factor, particularly for younger and sexually inexperienced youth. Having positive peer role models may delay sexual initiation, particularly for youth ages 13 to 17.

Romantic involvement and partners' characteristics, expectations, and intentions were related to youth's sexual behaviors. For example, youth were more likely to initiate sexual activity when they were dating or in a serious relationship with someone three years or older than themselves. Partners' expectations and intentions to have sex can act as a risk factor for initiating sexual activity, particularly for females. Female adolescents often reported having initiated sexual activity to meet their romantic partners' expectations.

Individual factors. Although environmental and interpersonal factors can influence youth behavior, effects vary by youth's individual characteristics. Biological factors such as age, gender, and race emerged as influential on sexual risk avoidance on their own as well as through moderating the relationships between other factors and outcomes. For example, as the age of youth increases, the likelihood of sexual initiation also increases. Gender influenced behavior differently for females and males, with adolescent males more likely to report an early sexual debut. In terms of race, the effect of being a member of a racial or ethnic minority group on sexual health outcomes varied among studies. In some studies, being African American or Hispanic predicted increased sexual activity. However, in other studies, Hispanic youth were more likely to avoid sexual activity, compared with their non-Hispanic peers.

Cognitive ability and emotional factors can also influence youth engagement in sexual activity. Higher levels of cognitive ability was a protective factor for remaining abstinent. The ability to regulate emotions was also a

protective factor for adolescents to abstain from sex. In contrast, both depressive symptoms and negative self-perception were risk factors associated with early sexual intercourse. Emotion regulation particularly deterred youth from initiating sexual activity when they encountered pressure from peers or romantic partners. Studies also suggested sexual refusal skills—the ability to say no to unwanted sexual advances—were protective for youth and generally increased the probability they would choose not to have sex.

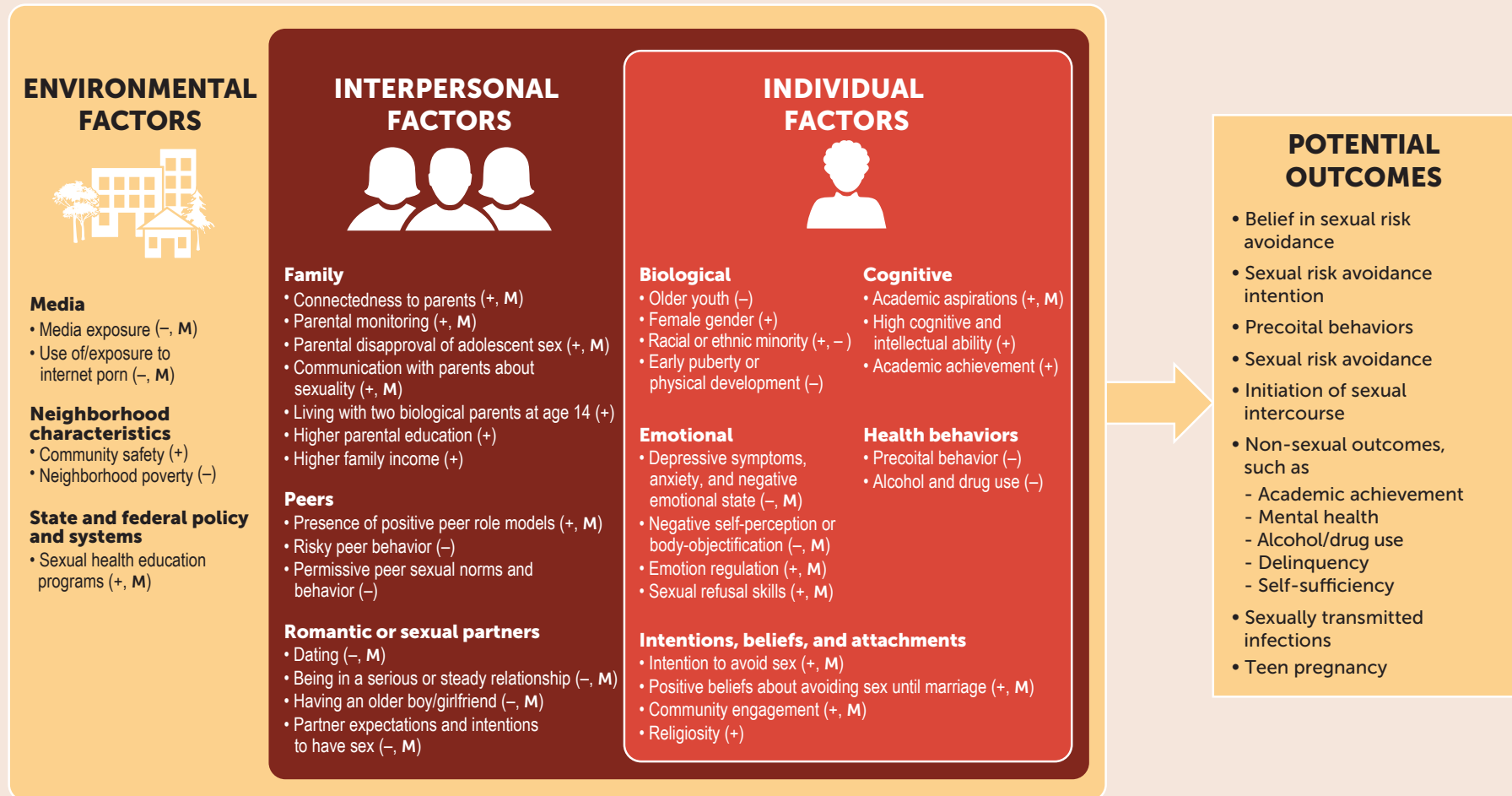
Finally, intentions, beliefs, and attachments influenced sexual risk avoidance outcomes. For example, religiosity—most commonly described as having personal religious beliefs—was protective and associated with avoiding sexual intercourse at a higher rate. In addition, literature suggested that health behaviors such as illegal alcohol and drug use were associated with early sexual initiation and susceptibility to being pressured into sex.

Sexual risk cessation conceptual model

The environmental-, interpersonal-, and individual-level factors influencing sexual risk cessation overlap in many cases with the factors that influence sexual risk avoidance. However, instead of influencing youth to avoid initiating sex, the factors in the sexual risk cessation model influence sexually experienced youth to discontinue engaging in sexual activity (Figure 3). The specific outcomes in the sexual risk cessation conceptual model, such as recent sexual intercourse, reflect that youth may progress toward cessation through intermediate outcomes. For instance, some sexually experienced youth might gradually decrease the frequency of sex and eventually discontinue having sex, whereas others might immediately discontinue sex. In this section, we discuss how identified factors influence sexual risk cessation outcomes for youth who had already initiated sex.

Environmental factors. Similar to sexual risk avoidance, youth exposure to media content through the Internet, television, movies, and magazines was a risk factor for increased sexual activity and increased permissive attitudes about sex during adolescence. The use of or exposure to Internet pornography also emerged as being associated with numerous sexual risk cessation outcomes including having recent sex partners, ever having engaged in anal sex, and use of alcohol and other drugs at most recent sex. Finally, similar to sexual risk avoidance, literature suggested that sexual health education programs can, but do not always, help achieve the intended sexual risk cessation outcomes.

Figure 2. Initial conceptual model for sexual risk avoidance



Sexual risk avoidance is defined as not engaging in sexual activity. This figure displays factors identified through a literature review as influential for sexually inactive youth on at least one of the potential outcomes. Only those factors identified as having sufficient evidence are included. Factors fall into three interrelated categories: environmental, interpersonal, and individual. They are grouped in order from distal to proximal in relation to the outcomes. Factors are marked as a protective factor or a risk factor based on whether the evidence showed that the factor was a positive (protective) influence (+) on the intended SRA outcomes or a negative (risky) influence (-) on the outcomes. In one case (racial or ethnic minority), evidence was mixed on the directionality of the influence. Given this, we labeled this factor with both a (+) and a (-). Factors may interact with each other to influence outcomes. Factors that are considered potentially modifiable by program intervention are marked with an “M”.

Interpersonal factors—peers and partners. Peers in youth’s social networks influence youth’s decision making as well as their intentions, norms, and behaviors related to sexual risk cessation. Risky peer behavior, such as alcohol or drug use, and permissive peer sexual norms were identified as factors that increased the probability of youth’s cognitive susceptibility to engage in sexual behavior, including sex without condoms and sex while using drugs. This was the case regardless of gender.

Romantic involvement and sexual partners’ characteristics, expectations, and intentions were often shown to influence sexual risk cessation-related outcomes. Being in a serious or steady relationship was identified as a risk factor for engaging in sexual activity, and the literature included evidence that living with a partner made it particularly difficult for young adults to disengage from sexual activity. Partners’ expectations and intentions to have sex can also act as a risk factor for continuing to engage in sexual activity.

There was limited evidence in the literature on the influence of family factors on sexual risk cessation outcomes. However, studies that focused on those who had already initiated sex suggested that living with two biological parents at age 14 was associated with less frequent sexual activity and fewer pregnancies experienced in the early 20s, particularly among White youth. Having a mother with a high level of education as opposed to having a mother with low level of education was also a protective factor for achieving the intended sexual risk cessation outcomes, especially for younger adolescents. The higher the level of a mother’s education, the more likely a youth was to decrease sexual activity.

Individual factors. Biological factors also emerged as influential for sexual risk cessation. Among those who had already initiated sex, being older increased the risk of recent sexual activity (in the past 3, 6, or 12 months), frequency of sexual activity, and pregnancy. Female gender was a protective factor for sexual activity, as adolescent males were more likely than females to be sexually active. However, some studies found female adolescents were more susceptible to sexual coercion and harassment.

Negative self-perception or body objectification was the only emotional factor identified as influential for a sexual risk cessation outcome. Qualitative studies indicated that a motivation to improve self-perception influenced a desire to discontinue sexual intercourse among African American youth. The literature also suggested that this factor was particularly influential for females, regardless of race. Similar to sexual risk avoidance, religiosity acted as a protective factor. Studies indicated that personal

religiosity was associated with increased choice to discontinue sexual intercourse after having already experienced it, and decreased sexual activity, especially for males and Hispanic youth.

Having a prior negative sexual experience such as being mistreated or used by a partner, having a partner who was unfaithful, or having experienced physical harm (such as rape, assault, or sexual coercion) was associated with an increased desire to discontinue sexual intercourse. In addition, having had a prior sexually transmitted infection diagnosis deterred youth from seeking and engaging in subsequent sexual encounters.

Relationships between factors

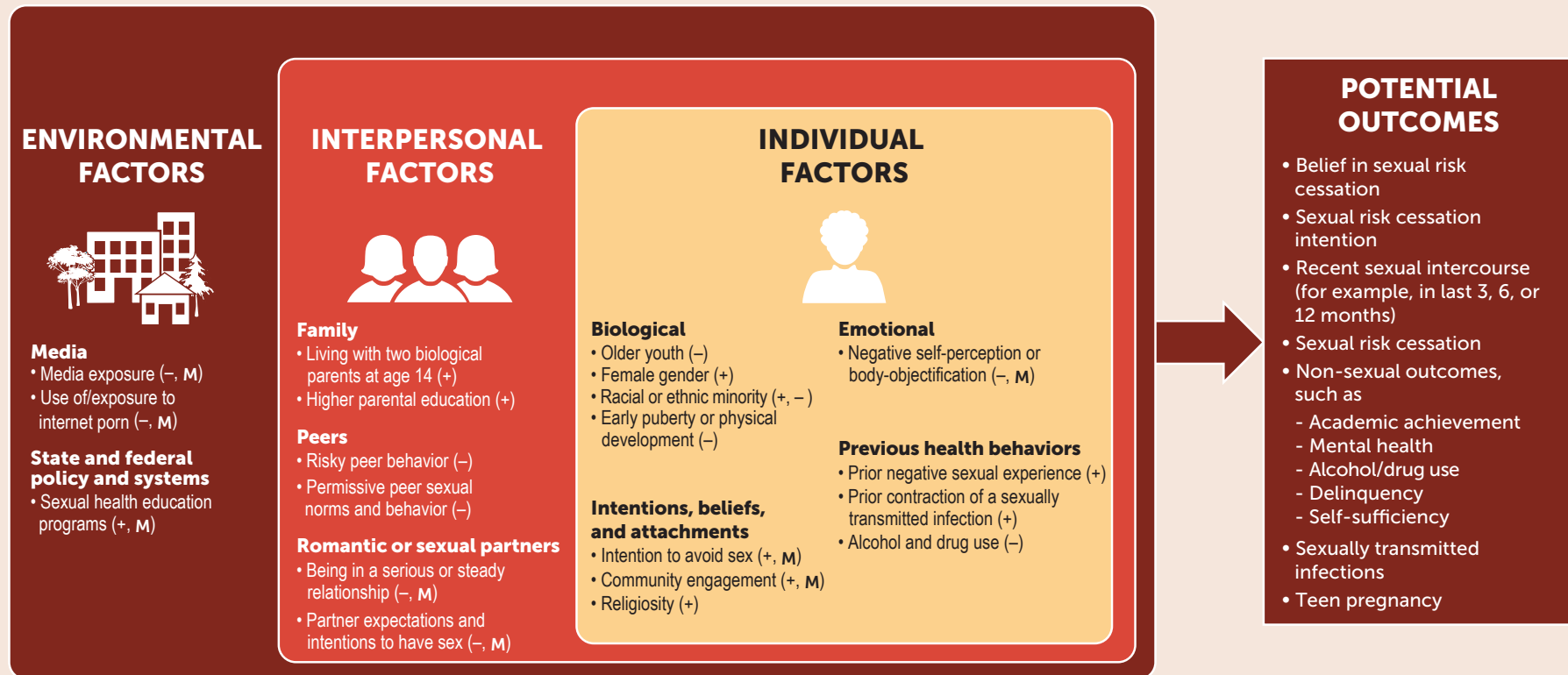
The complex and dynamic environment in which we live makes it difficult to disentangle the influence of a single factor on youth sexual behavior. The ways that youth reach outcomes are complex and differ based on individual circumstances and experiences. The process used to develop the sexual risk avoidance and sexual risk cessation conceptual models identified specific factors that studies suggest influence youth sexual behavior, and also highlighted several interactions between certain factors and youth sexual behaviors. These factors—**family poverty, gender, race/ethnicity, and age**—acted as moderators to influence the strength of the relationship between another factor (or factors) and outcomes.

Notable similarities and differences between the sexual risk avoidance and sexual risk cessation conceptual models

- More factors are associated with sexual risk avoidance outcomes than sexual risk cessation outcomes, potentially due to limited research on sexual risk cessation.
- Factors at the individual level are most prevalent for both sexual risk avoidance and cessation.
- The role of parents and family was more pronounced for sexual risk avoidance than sexual risk cessation, potentially due to limited research on sexual risk cessation.

High family income moderated the relationship between not having sex and high school graduation. That is, avoiding sex was positively associated with high school graduation among youth from high-income families, but not among youth from low-income families.

Figure 3. Initial conceptual model for sexual risk cessation



Sexual risk cessation is defined as discontinuing consensual sexual activity after having engaged in it. This figure displays factors identified through a literature review as influential for sexually active youth on at least one of the potential outcomes. Only those factors identified as having sufficient evidence are included. Factors fall into three interrelated categories: environmental, interpersonal, and individual. They are grouped in order from distal to proximal in relation to the outcomes. Factors are marked as a protective factor or a risk factor based on whether the evidence showed that the factor was a positive (protective) influence (+) on the intended SRC outcomes or a negative (risky) influence (-) on the outcomes. In one case (racial or ethnic minority), evidence was mixed on the directionality of the influence. Given this, we labeled this factor with both a (+) and a (-). Factors that are considered potentially modifiable by program intervention are marked with an "M".

Another moderator related to **gender**. Some factors had more influence on outcomes for female youth, and others on outcomes for male youth. Factors associated with risky behavior for **females** included having an older boyfriend, partner's expectations and intentions to have sex, low cognitive ability, and negative self-perception or body objectification. There was also more evidence that religiosity was more strongly associated with decreased sexual activity among **males** than among females.

In terms of **racial and ethnic differences**, some factors were particularly influential and protective among White youth, and less so among Hispanic or African American youth. For example, factors that were influential and protective among White youth included cognitive and intellectual ability, closeness with parents, living with two biological parents at age 14, and peer role models. One factor that may be especially influential and protective for African American youth was positive self-perception. There is some evidence that religiosity may be more influential and protective for Hispanic youth relative to other racial and ethnic groups.

Age moderated the relationship between various factors and outcomes related to sexual risk avoidance and cessation. Several factors were influential and protective for sexual risk behavior of younger youth, including positive peer role models, parental monitoring, parental education, and age of romantic partner.

Factors excluded from the models and other limitations

The influencing factors and outcomes in the initial sexual risk avoidance and sexual risk cessation models are subject to the limitations of the literature reviewed. Through the literature screened into our study and discussions with experts, we identified, considered, and discussed many factors as potential influences on sexual risk avoidance or sexual risk cessation. Some identified factors did not have enough evidence in the literature we reviewed to assess their potential influence on the targeted outcomes. As a result, the initial models did not include these factors. Table 1 highlights factors identified as potentially influencing sexual risk avoidance or cessation, but that were not included in a model due to an insufficient amount or quality of evidence in the literature we reviewed. Based on the approach used to develop these models, these factors may or may not influence sexual risk avoidance or cessation. More research is necessary to determine their influence.

The literature review also did not support an assessment of the magnitude of effects or relative influence of factors across studies or within levels of the social ecological model. Because our literature review included articles that used a range of analytical approaches, including quantitative studies (such as randomized controlled trials, longitudinal studies, and cross-sectional studies) and qualitative studies (such as meta-analyses of quantitative studies and analyses of qualitative data), we were not able to assess the magnitude of the effect of factors across the articles. This limitation prevented us from identifying the most or least influential factors, either in general or for specific subgroups of youth. Likewise, a full examination of the complex interactions between various factors and the target outcomes was beyond the scope of this project.

Table 1. Factors with insufficient evidence for inclusion in the models that may warrant further review

Environmental factors

Exposure to media campaigns (M)
 Contraceptive access (M)
 School characteristics
 Exposure to alcohol, tobacco, drugs,
 or firearms

Interpersonal factors

History of physical abuse by caregivers
 Being born to teen parents
 Housing instability
 Connection to positive adult role model (M)
 Permissive parental sexual norms and
 behavior (M)
 Positive peer values
 Use of social media (M)

Individual factors

Academic achievement (only for sexual risk
 cessation)
 Attachment vulnerability
 General risk-taking (M)
 Self-efficacy (M)
 Self-esteem (M)
 Impulsive personality
 Values (M)

Note: Factors that are considered potentially modifiable by intervention are marked with an "M".

Conclusion and next steps

The initial conceptual models for sexual risk avoidance and sexual risk cessation offer a preliminary blueprint for understanding the factors that influence youth outcomes related to avoidance and cessation of sexual risk behaviors. Multiple factors at the environmental, interpersonal, and individual levels influence the target outcomes. Many of these factors can be modified through intervention (as noted in the figures). Program developers and practitioners may wish to consider these modifiable factors when designing and improving program interventions.

These initial conceptual models will be refined over the next year. The refinement will largely be informed by future survey work, sponsored by the Administration for Children and Families, as well as a planned secondary analysis of the National Longitudinal Study of Adolescent to Adult Health (Add Health) data. In particular, these analyses will explore the potential influence of factors that were excluded from the models because of insufficient evidence. These analyses will then allow us to refine the models by potentially including additional factors that influence sexual risk avoidance or cessation. The conceptual model for sexual risk cessation also will inform the future development of a program model for risk cessation. The program model is building on the identified factors that influence risk cessation by defining a comprehensive intervention approach.

The limitations of this study point to several opportunities for future research. First, the field might benefit from additional research on the potentially modifiable factors that were excluded from the initial models due to a lack of sufficient evidence in our literature review. Second, research to assess the relative magnitude of the influence of specific factors could help determine which factors may be most important for influencing target outcomes. Third, an examination of the relative importance of influencing factors for particular subgroups of youth could help identify how the influence of factors varies by subgroup. Fourth, studies that identify how the influencing factors interact, and the trajectories or pathways that youth may take on the way to key outcomes, would place the field in a stronger position to support youth. Finally, qualitative examinations of the implications of the models for practice could help guide efforts to improve and strengthen the program strategies that target influencing factors.

Overall, these additional research efforts could help enhance the field's ability to apply lessons from the conceptual models to practice in ways that help youth avoid sexual risk and attain optimal health.

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This brief and others sponsored by the Office of Planning, Research, and Evaluation are available at <http://www.acf.hhs.gov/programs/opre>.

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Section A includes all the sources included in our in-depth literature review. Section B includes all other sources cited in the memo. Tables A.1, A.2, and A.3 indicate which sources from the literature review contributed to the evidence for each factor category.

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Table A.1. References by type of environmental factor category

Reference	Environmental Factor Categories		
	Media	Neighborhood Characteristics	State and Federal Policy and Systems
Bleakley et al. 2018	X		
Boone 2015	X		
Collins et al. 2004	X		
Collins et al. 2010	X		
Kirby & Lepore 2007		X	X
Kugler et al. 2017		X	
L'Engle & Jackson 2008	X		
Martino et al. 2006	X		
Noar et al. 2009	X		
Noar et al. 2010	X		
Noar 2006	X		
Oman et al. 2003		X	
Arcidiacono et al. 2012		X	
Santelli et al. 2017		X	X
Santelli et al. 2007		X	
Popkin et al. 2009		X	
Van Stee et al. 2012	X		
Ward et al. 2011	X		

Table A.2. References by type of interpersonal factor category

Reference	Interpersonal Factor Categories		
	Family	Peers	Romantic or Sexual Partners
Abbott & Rochelle 2008	X		X
Abama & Martinez 2017	X		X
Bleakley et al. 2018	X		
Bazargan et al. 2006		X	
Bradley et al. 2012	X		X
Buhi et al. 2011	X		
Caputo 2009	X	X	
Collins et al. 2004	X		
Collins et al. 2010	X	X	
Ybarra & Mitchell 2005	X		
Halpern et al. 2006	X		
Jaccard 2004			X
Uecker et al. 2015	X		
Uecker 2015		X	
Jumping-Eagle et al. 2008	X		
Kirby & Lepore 2007	X	X	X
L'Engle & Jackson 2008	X		
L'Engle et al. 2006	X		
Marin et al. 2006		X	X
Martinez et al. 2011	X		
Oman et al. 2003	X	X	
Pearson et al. 2012	X		
Arcidiacono et al. 2012	X		
Rector & Johnson 2005	X		
Sabia & Rees 2009	X		
Sabia 2006	X		
Scott et al. 2011	X		
Sieving et al. 2006	X	X	X
Smith et al. 2014		X	
Suleiman 2013			X
Popkin et al. 2009	X		
Tolma et al. 2008	X	X	
Kaiser Family Foundation 2003		X	X
Voisin & Neilands 2010		X	
Wu & Martin 2015	X		
Zimmer-Gembeck & Helfand 2008	X		X

Table A.3. References by type of individual factor category

Reference	Individual Factor Categories				
	Biological	Cognitive	Emotional	Intentions, Beliefs, and Attachments	Health Behaviors
Arcidiacono et al. 2012		X		X	
Abbott & Rochelle 2008	X	X		X	X
Abama & Martinez 2017	X			X	
Bleakley et al. 2018	X	X			
Ascend and Barna Group 2016	X			X	
Ballonoff et al. 2015	X				
Bazargan et al. 2006	X				
Birch 2011	X			X	
Bradley et al. 2012	X	X	X	X	X
Buhi et al. 2011	X			X	
Byers et al. 2016	X			X	X
Caputo 2009	X	X	X	X	
Chin et al. 2012	X				
Collins et al. 2004		X		X	
Collins et al. 2010	X				
Dewitte 2009	X				
Halpern et al. 2006	X			X	
Houck et al. 2016a	X	X	X		
Houck et al. 2016b		X	X		
Jaccard 2016			X	X	
Uecker et al. 2015	X	X			
Uecker 2015	X	X	X		
Jumping-Eagle et al. 2008	X				X
Kirby & Lepore 2007	X		X	X	X
Kugler et al. 2017	X	X			
L'Engle & Jackson 2008	X	X		X	
L'Engle et al. 2006	X	X	X	X	
Lindberg et al. 2016					X
Loewenson et al. 2004	X				
Lowry et al. 2017	X				X
Majer et al. 2004					
Marin et al. 2006	X				
Martinez et al. 2011	X			X	

(continued)

Individual Factor Categories

Reference	Biological	Cognitive	Emotional	Intentions, Beliefs, and Attachments	Health Behaviors
Noar et al. 2010	X				X
Oman et al. 2003	X				
Pearson et al. 2012	X	X	X	X	X
Poobalan et al. 2009	X				
Protogerou et al. 2014	X				
Raspberry et al. 2009	X			X	
Rector & Johnson 2005	X				
Rosenbaum 2006	X				X
Rue et al. 2012	X				
Sabia & Rees 2009	X	X	X		
Sabia 2006		X	X		
Santelli et al. 2007					X
Scott et al. 2011	X	X			X
Sieving et al. 2006	X				
Smith et al. 2014				X	X
Suleiman 2013	X	X	X		
Popkin et al. 2009	X				
The Center for Relationship Education 2010				X	
Tolma et al. 2008	X			X	
Van Der Pol 2007	X			X	
Vasilenko 2017	X				
Kaiser Family Foundation 2003					X
Voisin & Neilands 2010	X	X			
Ward & Linke 2011		X			
Wheeler 2010	X	X			
Wu & Martin 2015	X	X	X	X	
Zimmer-Gembeck & Helfand 2008	X	X	X	X	X
Zimmerman et al. 2014		X			