

Parent–Adolescent Sexual Communication and Adolescents’ Sexual Behaviors: A Conceptual Model and Systematic Review

Adam A. Rogers¹

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Abstract Parent–adolescent sexual communication can help reduce sexual risk behaviors among adolescents. However, research and theory are less clear regarding the specific pathways (i.e., mechanisms of change) by which this communication works to reduce sexual risk behavior. The current review addresses this gap by proposing a conceptual model describing the processes by which parent–adolescent sexual communication influences adolescents’ sexual intentions and behaviors and by conducting a systematic review to locate evidence for this model. Guided by the Integrative Model of Behavioral Change, the proposed conceptual model focuses on the social cognitive pathways that act as explanatory mechanisms of the relations between parent–adolescent sexual communication and adolescents’ sexual intentions and behaviors, as well as the characteristics of this communication that determine its effectiveness in influencing these sexual cognitions. Thirty-eight peer-reviewed studies were systematically located and synthesized. Findings showed consistent links between parent–adolescent sexual communication and adolescents’ sexual attitudes and safe-sex efficacy (though links with perceived sexual norms were more mixed), which in turn may influence their sexual intentions and behaviors. Evidence also emerged to suggest that the characteristics of the communication itself (e.g., extent, content, quality) may influence its effectiveness over adolescents’ sexual cognitions. The identification of these processes advances theory on parent–adolescent sexual communication which has, to

date, been unclear regarding these pathways. As such, these findings can inform future research efforts as well as prevention efforts seeking to promote adolescent sexual health.

Keywords Parent–adolescent sexual communication · Parent–child communication · Sexual behavior · Sexual risk · Parent–child relationship

Introduction

By the time American adolescents graduate from high school, more than 60% have had sexual intercourse (Abma et al. 2010). Although recent trends in adolescents’ sexual health are generally positive (e.g., later age at first sex, greater contraceptive use), sexual activity among adolescents continues to raise important health concerns. For example, more than 15% of teens have had sexual intercourse by the age of 15 (Finer and Philbin 2013), and somewhere between 30 and 40% of teens use condoms inconsistently or never during sexual activity (National Center for Health Statistics 2010), placing them at substantial risk for sexually transmitted infections and unintended pregnancies.

Parent–adolescent sexual communication is increasingly regarded by scholars as a means for reducing sexual risk behavior among adolescents. A recent meta-analysis showed that, overall, adolescents whose parents talk to them about sexuality generally exhibit safer sexual behaviors (e.g., more consistent condom use; Widman et al. 2015). Despite these overall trends, research and theory is unclear regarding the specific pathways (i.e., the mechanisms of change) that explain how parent–adolescent sexual communication can influence adolescents’ sexual

✉ Adam A. Rogers
adam.rogers@asu.edu

¹ T. Denny Sanford School of Social and Family Dynamics, Arizona State University, 951 S Cady Mall, PO Box 873701, Tempe, AZ 85287, USA

behaviors. Studies report predominantly on direct relations between parent–adolescent sexual communication and adolescents' sexual intentions and/or behaviors, leaving its explanatory pathways largely unexplored. An understanding of these pathways is critical for both research and practice that aims to promote the sexual health of adolescents.

Two goals guide the current study. The first goal is to establish a conceptual model that explains the processes by which parent–adolescent sexual communication influences adolescents' sexual intentions and behaviors. To this end, a theoretical extension of the Integrative Model of Behavioral Change (Fishbein and Ajzen 2010) is proposed. The second goal is to systematically review empirical evidence for the conceptual model, identifying emergent themes, gaps, and persisting methodological barriers. The organization of this review maps onto these goals. First, the conceptual model is proposed. Then, the procedures and results of the systematic review are described in detail. It ends with a discussion of findings and their implications for research and practice related to parent–adolescent sexual communication.

Conceptual Model of How Parent–Adolescent Sexual Communication is Associated with Adolescents' Sexual Intentions and Behaviors

The conceptual model describes the processes by which parent–adolescent sexual communication might influence adolescents' sexual intentions and/or behaviors. This model consists of two main components, each borrowed from an existing field of theory and research. The first component describes parent–adolescent sexual communication as influencing adolescents' sexual cognitions, which in turn influence their sexual intentions and behaviors. The second component describes the characteristics of the communication itself that make it more or less persuasive over adolescents' sexual cognitions.

Sexual Intentions and Behaviors as a Function of Sexual Cognitions

The first component of the conceptual model draws upon The Integrative Model of Behavioral Change (Fishbein and Ajzen 2010) to explain an adolescent's sexual intentions and behaviors as a function of his/her sexual cognitions. Derived from the Theory of Planned Behavior (TPB; Ajzen 1991) and the Theory of Reasoned Action (Ajzen and Fishbein 1980), the Integrative Model's central premise is that cognitions regarding the self-performance of a specific behavior are the determinants of that behavior. According to this model, three fundamental social cognitions influence

health-related intentions and behaviors. *Attitudes* refer to an individual's evaluation, positive or negative, of performing a particular behavior for the self. *Perceived norms* consist of both descriptive norms—the perceived prevalence and normativity of the behavior—and injunctive norms—the perceived approval or disapproval from others regarding performance of the behavior. *Self-efficacy* refers to one's perceived ability to perform or refrain from a behavior (sometimes measured as perceived behavioral control). These three cognitions work to influence one's *intention* to enact the behavior, which in turn influences his/her performance of the *behavior*.

Reviews and meta-analyses verify the predictive power of attitudes, perceived norms, and self-efficacy on sexual intentions and behaviors. Albarracín et al. (2001) conducted a meta-analysis of nearly 100 separate data sets and found that condom use intentions were predicted by attitudes toward condoms ($r = .58$), perceived norms of condom use ($r = .39$), and perceived behavioral control over the use of condoms ($r = .45$). Sheeran and Taylor's (1999) meta-analysis also showed medium to strong average correlations among condom use attitudes, norms, behavioral control, and actual condom intentions and condom use. These sexual cognitions are significantly associated with sexual behaviors among adolescent populations as well (van de Bongardt et al. 2015; Buhi and Goodson 2007).

Because these cognitions have proven successful in predicting sexual intentions and behaviors, they find straightforward theoretical application to the present question of how parent–adolescent sexual communication can influence adolescents' sexual intentions and behaviors (see Fig. 1 for conceptual model). Specifically, parent–adolescent sexual communication may influence change in adolescents' attitudes toward engaging in sexual behavior, their perceived norms regarding sexual behaviors, and/or their self-efficacy toward sexual and safe sexual behaviors. In turn, these social cognitions can influence adolescents' sexual intentions, which then influence adolescents' sexual behaviors. The review that follows gathers evidence for attitudes, perceived norms, and self-efficacy as pathways through which parent–adolescent sexual communication influences adolescents' sexual intentions and/or behaviors. Note that, in addition to behaviors, intentions are considered an outcome of interest in the review, their mediating influence to behaviors being assumed given their strong predictive relation therewith.

Finally, it should be noted that the Integrative Model also considers the importance of external variables (i.e., those outside the individual's control) that can modify the processes previously described. These include *environmental constraints*, *knowledge*, and *tendencies/habit*. For example, a couple's intention to use a condom during their next sexual experience may not translate to behavior if they

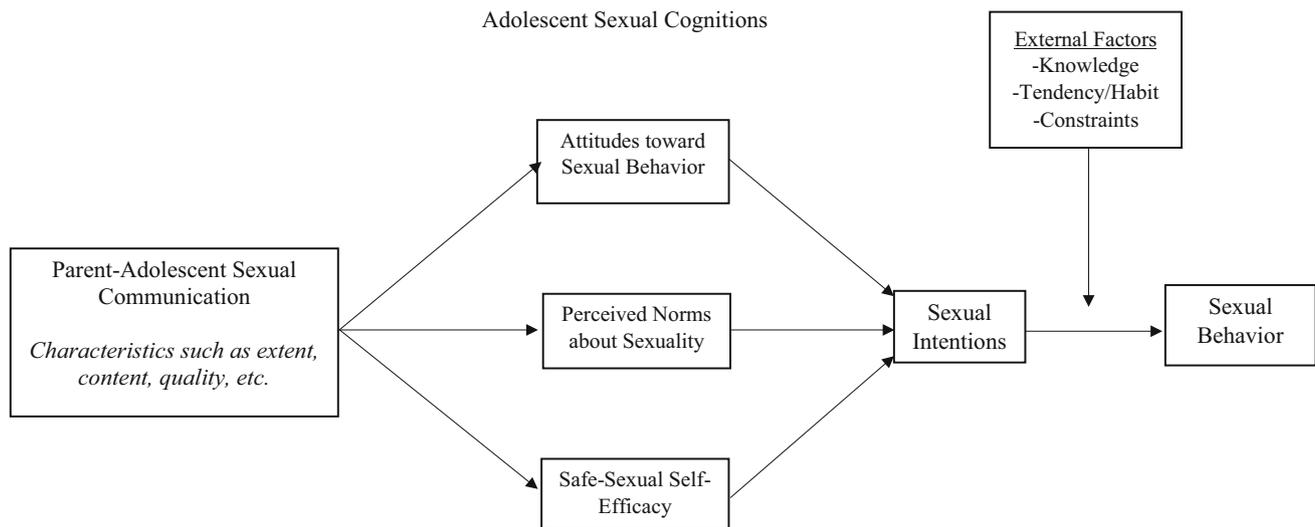


Fig. 1 Conceptual model of pathways that explain associations between parent–adolescent sexual communication and adolescents’ sexual intentions/behaviors. *Note* This is the full conceptual model proposed in the study. However, the review focused only on mediated

paths from parent–adolescent sexual communication to adolescents’ intentions and/or behaviors via their sexual cognitions (attitudes, perceived norms, and efficacy), and direct paths from parent–adolescent sexual communication to adolescents’ sexual cognitions

lack access to condoms and the knowledge of how condoms work. These external variables are acknowledged theoretically as an important determinant of adolescents’ sexual behaviors, though they are not examined in the review. Instead, the review focuses specifically on the aforementioned mediated pathways through social cognitions (attitudes, perceived norms, and self-efficacy) to sexual intentions and/or behaviors.

Communication Characteristics that Modify the Effectiveness of Parent–Adolescent Sexual Communication

Literature on persuasion and attitudinal change suggests that the features of and surrounding a given communication (e.g., its source, its recipient, its message, its context) determine its effectiveness (Berlo 1960). Drawing upon this idea, Jaccard et al. (2002) called for greater scholarly attention to the various features of parents’ sexual communication that determine its effectiveness in changing adolescents’ sexual cognitions, and thereby their sexual intentions and behaviors. For example, parents may be the source of sexual communication, but parents vary by gender, sexual values, expertise on sexual topics, parenting styles, and trustworthiness, to name only a few of these characteristics. Similarly, adolescents may be the recipients of sexual communication, but they also vary in their gender, development, personality traits, and peer and familial contexts. Many such features are likely to produce meaningful variability in how effective parents’ sexual communication actually is. The review cannot address these in

their fullness, but uses extant literature to provide a starting point.

Of growing emphasis in the literature on parent–adolescent sexual communication are the characteristics of the sexual communication itself. Initially, researchers focused primarily on the *overall extent* of this communication (i.e., the depth, breadth and frequency of sexual conversations). Studies now also consider its *content* (i.e., the actual messages conveyed, ranging from reproductive physiology to safe sexual behaviors) and its *quality* (i.e., the interpersonal dynamics of the conversation, often conceptualized as the level of comfort and openness; Lefkowitz 2002). These characteristics may produce meaningful variability in the effectiveness of parent–adolescent sexual communication to influence adolescents’ sexual cognitions, and thereby their intentions and behaviors. For example, abstinence messages might successfully convey parental disapproval of sexual behavior (a perceived norm), but will likely fail in teaching safe sex communication skills with a partner (self-efficacy). Further, the level of respect, comfort, and openness (i.e., quality) during these conversations may influence how receptive adolescents are to parents’ sexual messages (Rogers et al. 2015). As of yet, no studies have synthesized these particular characteristics and their associations with adolescents’ sexual outcomes in a systematic manner. Thus, the review also gives specific attention to how the overall extent, content, and quality of parent–adolescent sexual communication differentially relate to adolescents’ sexual cognitions (i.e., attitudes, perceived norms, and self-efficacy).

The Current Study

Figure 1 joins the various characteristics of parents' sexual communication and the Integrative Model of Behavioral Change (Fishbein and Ajzen 2010) to explain how parent–adolescent sexual communication may influence adolescents' sexual intentions and behaviors. Specifically, when parents engage their adolescent children in discussions about sex, the characteristics of that communication (e.g., the extent, the content, and the quality) work uniquely and/or interactively to influence adolescents' attitudes, perceived norms, and self-efficacy regarding the behavior under discussion. These cognitions, in turn, influence adolescents' intentions to perform the target behavior, which, when accompanied by a lack of environmental constraints, can translate into adolescents' enactment of the target behavior.

The current review will systematically locate and summarize empirical evidence for the proposed conceptual model. Primarily, the review will summarize evidence for the influence of parent–adolescent sexual communication on sexual intentions and/or behaviors via attitudes, perceived norms, and self-efficacy. To do so, it will document direct relations between parent–adolescent sexual communication and adolescents' sexual attitudes, perceived norms, and/or self-efficacy; and indirect relations in which parent–adolescent sexual communication is associated with adolescents' sexual intentions and/or behaviors via these sexual cognitions. Direct relations between parent–adolescent sexual communication and sexual intentions or behavior are beyond the scope of the review (see Widman et al. 2015, for a more thorough treatment). Then, it will summarize how the communication characteristics of parent–adolescent sexual communication (e.g., its extent, content, and quality) differentially relate to adolescents' sexual cognitions. The methodological rigor of the studies is also considered.

Method

Selection Criteria

Articles had to meet five criteria to be included in the review. First, studies had to model parent–adolescent sexual communication as an independent variable predicting at least one of the three focal social-cognitive mechanisms. Thus, studies were included if they modeled indirect or mediated pathways between parent–adolescent sexual communication and sexual intentions and/or behaviors via sexual attitudes, perceived norms, and/or self-efficacy. Also included were studies that modeled relations between

parent–adolescent sexual communication and one of the social cognitive mechanisms (representing the first part of a mediated process). Studies that examined direct associations between parent–adolescent sexual communication and intentions/behaviors were excluded, as such were beyond the scope of the review.

Second, and related to the first criterion, studies had to operationalize sexual cognitions (attitudes, perceived norms, self-efficacy) in a manner consistent with the Integrative Model's conceptualization of these constructs. Under this model, a sexual cognition is specific to the performance of the behavior, meaning that more generalized attitudes about sexual topics do not necessarily apply. For example, attitudes about broader social issues, such as gendered norms of sexual expression, are not directly in line with this conceptualization, whereas an attitude reflecting a judgment on whether or not to have sex with a partner is. Careful attention was given such that the sexual cognitions measured were specific to the performance of a behavior.

Third, studies had to report on participants between ages 10–24. This introduces emerging adult samples into the reviewed studies. This decision was made because many studies on parent–adolescent sexual communication rely on emerging adult samples, which are easier to access for the study of sensitive topics such as this. As the key objective of this review was to gather evidence for a new conceptual model, these studies were deemed potentially valuable for the current purposes.

Fourth, studies had to report data from independent samples. No studies among the final selection of studies reporting on the same constructs did so using statistically dependent samples. Fifth, articles had to be published in peer-reviewed journals. Studies that did not meet this criterion, such as dissertations and theses, were omitted. No exclusion criteria were specified for the year of the publication or the country in which the study was conducted.

Retrieval of Studies

Studies were retrieved in May and June of 2016. Retrieval began by searching three online databases, PsycInfo, PubMed (MedLine) and Web of Science, with the following search string: ab(parent* or mother* or father* or family) and ab(adolescen* or youth or teen*) and ab(communicat* or convers* or discuss* or talk*) and ab(sex or sexual* or condom* or contracept* or “birth control”). This search strategy yielded 2325 unique articles published in English and in refereed journals. Titles and abstracts were read and articles that were not substantively relevant, or which clearly did not meet the selection criteria were discarded. This process yielded 352 substantively relevant studies. To determine which of these met all

selection criteria, abstracts and, if necessary, full texts were read. This process yielded 36 total studies. Then, these studies were reviewed for references to studies that were not located by the online database searches (i.e., the ancestry method). This method yielded an additional 2 studies. In total, 38 studies were located and comprise the present review (see Fig. 2). Given that the author alone conducted the search, this retrieval process was conducted twice in full to ensure its accuracy.

Data Abstraction

Results of statistical tests representing the focal mediated pathways were indexed. When both multivariate and univariate results were reported, multivariate results were given preference under the assumption that they control for the influence of potentially confounding variables (e.g., family climate variables). These results were then considered on the basis of statistical significance and direction of effects to provide evidence for the conceptual model.

Then, characteristics of parents' sexual communication were indexed, with particular attention to the overall extent, the content, and the quality of parent–adolescent sexual communication. Studies were indexed as assessing *overall extent* when the frequency or extent of parents' communication of sexual topics (e.g., reproductive physiology, condom use) was aggregated for an overall score. Some studies assessed parents' communication on a specific topic (e.g., safe sex practices, sexual values); these studies were indexed as assessing *content*. Finally, studies that examined the degree of openness, comfort, and respect during sexual conversations were indexed as assessing *quality*.

Finally, key methodological characteristics were indexed and reported in the results to indicate the overall methodological quality of the reviewed studies. These characteristics were sample size, racial and/or ethnic breakdown of sample, sampling strategy (e.g., random vs. non-random; national vs. non-national), study design (e.g., cross sectional vs. longitudinal; survey, observational, etc.), analytic strategies (e.g., SEM, logistic regression, ANOVA), and statistical adjustment for family climate variables (e.g., general family communication). Because only the author reviewed the literature, the indexing process was completed twice to help ensure accuracy of the data abstraction.

Results

Summary of the Studies

The 38 studies were published between 1986 and 2015 across 30 peer-reviewed journals. Fifteen of these journals

were social or behavioral science publications, thirteen were medical or health related journals, one addressed communications topics, and one was sex-specific. Twenty-eight studies (74%) represented adolescents (ages 10–18), whereas 10 studies (26%) examined emerging adults (ages 18–24). Most studies included male and female participants ($k = 28$; 74%), with some female-only samples ($k = 9$; 24%) and one male-only sample (2%). Predominant ethnicities were Caucasian ($k = 15$; 39%) African-American ($k = 14$; 37%), Latina/o ($k = 4$; 11%), mixed ($k = 2$; 5%) and not reported ($k = 3$; 8%). Most studies took place in the U.S. ($k = 36$, 95%).

Methodological Characteristics

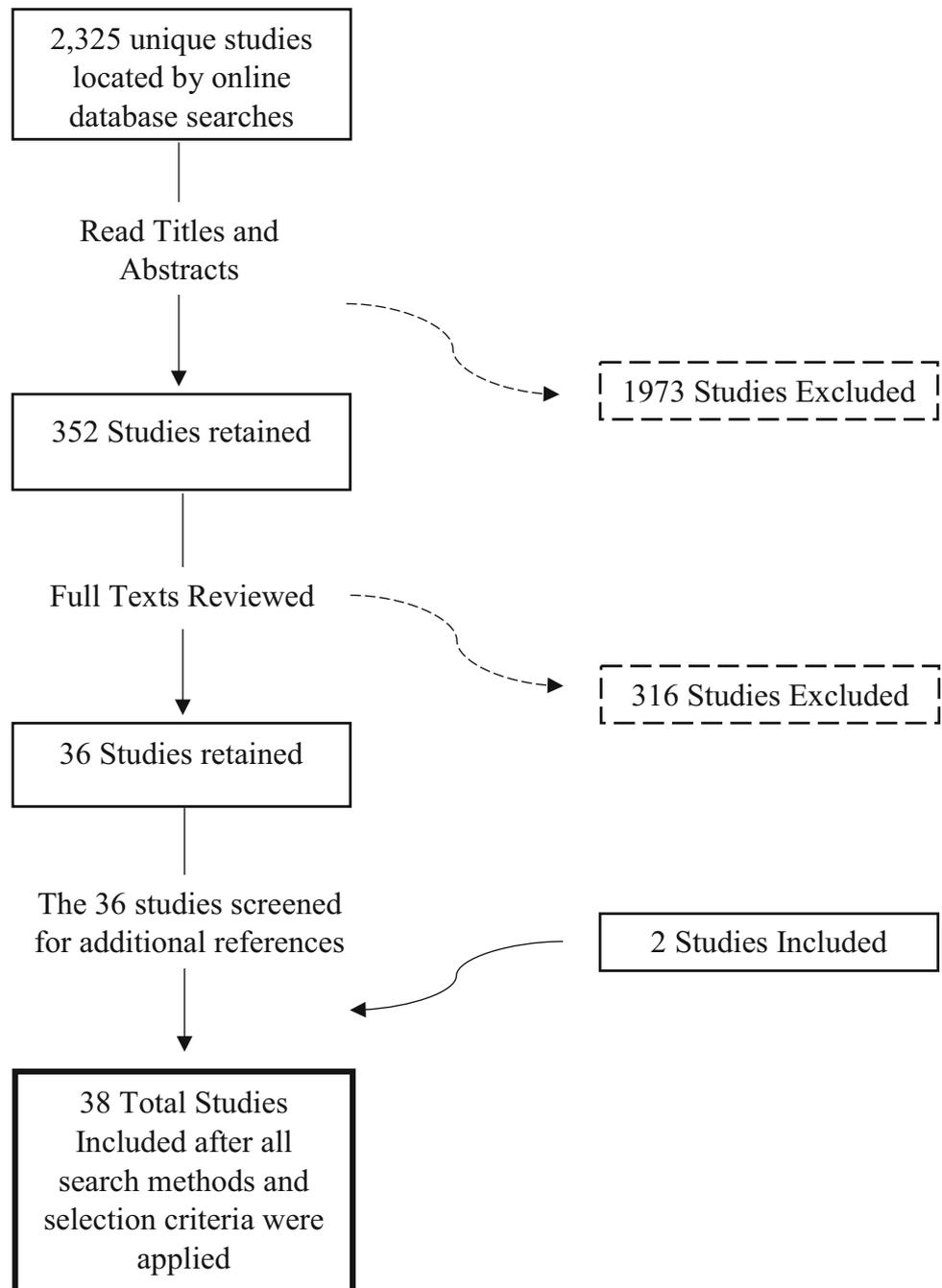
Among the studies, sample sizes ranged from 55 to 1587 with a median sample size of 297 (see Table 1). Not quite half of the studies ($k = 18$; 47%) had sample sizes greater than 300. Thirty-four studies (89%) used non-random sampling strategies and four (11%) used randomized procedures. The vast majority of studies used data from localized samples (e.g., community, school); only one reported on state-wide data. Thirty-two studies (84%) used cross-sectional designs versus longitudinal designs ($k = 6$; 16%). Seven studies (18%) used an established measure for parent–adolescent sexual communication (i.e., psychometrically tested and/or empirically validated), meaning that 31 studies (82%) used self-developed assessments. Only one study (3%) used an observational design with the remaining 37 (97%) using self-report questionnaires. Family climate variables were statistically controlled for in 10 of the studies (26%). These variables included parental monitoring, parent–child relationship quality/closeness/satisfaction, and general family communication. The statistical procedures used as the primary test of hypothesized relations included multiple regression ($k = 18$; 47%: OLS, logistic), path analysis, usually SEM ($k = 9$; 24%), correlation ($k = 5$; 13%: Pearson, Spearman, Canonical), Analysis of Variance (ANOVA; $k = 3$; 8%), and simple group difference tests ($k = 4$; 11%: t test, Chi square).

Direct Relations Between Parent–Adolescent Sexual Communication and Sexual Attitudes, Perceived Norms, and Self-Efficacy

Attitudes

In total, 24 studies examined associations between parent–adolescent sexual communication and sexual attitudes. These attitudes included adolescents' overall evaluation of engaging in sexual behavior ($k = 17$) from positive (typically labeled *permissive*) to negative (typically labeled *conservative*); sexual expectancies (adolescents' perceived

Fig. 2 Flow diagram for selection of studies



health and emotional consequences of engaging in sexual behavior; $k = 4$); and condom-related attitudes (adolescents' evaluations, positive or negative, toward using condoms; $k = 6$) (see Table 2 for summary of findings). Some studies assessed multiple types of attitudes, which is why the sum of these is greater than 24.

Conservative/Permissive Sexual Attitudes Nine studies showed that parent–adolescent sexual communication significantly predicted less permissive/more conservative

attitudes toward engaging in sex (Cederbaum et al. 2013; DiIorio et al. 1999; Harris et al. 2013; Holman and Kellas 2015; Hutchinson and Montgomery 2007; Kowal and Blinn-Pike 2004; Miller et al. 1998; Moore and Davidson 1999; Treboux and Busch-Rossnagel 1995). Seven studies reported mixed findings (i.e., an empirical relation was only found for a meaningful subset of the sample and/or a particular variable of interest), which are detailed as follows. Nikken and de Graaf (2013) found parent–adolescent sexual communication to longitudinally predict less

Table 1 Summary of the 38 reviewed studies, methodological information, and major findings

First author (ref. Table 2)	Yr.	PASC variable	DVs pertaining to framework	N	Sample characteristics	Sampling strategy	Study design	Analysis	Major findings pertaining to the conceptual model
Beadnell (1)	2007	Messages (safe sex)	Attitudes (permissive) Perceived norms (peer injunct.) Self-efficacy (safe-sex; resist unwanted sex) Intentions for sex Sexual intercourse	790	Grades 9–11 52% white 53% female Initiated sex n/a	Non-random, school	Longitudinal, survey	SEM	PASC indirectly associated with greater intentions for sex and greater sexual behavior via perceived norms. Indirect links through attitudes and efficacy were not significant
Bleakley (2)	2009	Parents as main sex educator	Attitudes (expectancies) Perceived norms (peer descr.)	459	Age 14–16 51% AA 60% female Initiated sex n/a	Non-random, community	Cross sectional, survey	SU Regression	PASC predicts greater awareness of risks of sexual activity, but not its perceived benefits. PASC not associated with perceived norms
Bynum (3)	2007	Overall extent	Attitudes (permissive)	75	Median age = 18 100% AA 100% female 58% initiated sex	Non-random, college	Cross sectional, survey	OLS regression [†]	PASC associated with daughters' more permissive sexual attitudes
Cederbaum (4)	2013	Messages (safe sex)	Attitude (conservative, condom-use) Perceived norms (peer injunctive about sex/condoms) Self-efficacy (safe-sex) Intentions for sex/condom use	176	Age 14–19 88% AA 100% female 43% initiated sex	Non-random, clinics and service organizations	Cross sectional, survey	SEM [†]	PASC predicted more positive views of abstinence, which predicted greater abstinence intention. PASC predicted perceived social approval for condom use. Perceived approval, in turn, predicted condom use intentions
DiClemente (5)	2001	Messages (safe sex)	Self-efficacy (condom use) Condom use	522	Age 14–18 100% AA 100% female 100% initiated sex	Non-random, clinical	Cross sectional, survey	Logistic regression [†]	PASC associated with greater efficacy to use condoms with a resistant partner
DiIorio (6)	1999	Messages (Safe Sex)	Attitudes (permissive)	405	Age 13–15 81% AA 56% male 29% sex. active	Non-random, community	Cross sectional, survey	Chi Square	PASC (with mothers, but not fathers) associated with more conservative sexual values
DiIorio (7)	2000	Overall extent	Self-efficacy (communicate with partner) Sexual communication with partner	1349	Age 18–25 51% white 63% female 100% initiated sex	Non-random, college	Cross sectional, survey	OLS regression [†]	PASC associated with greater efficacy to communicate about safe sex practices with sexual partner
Dittus (8)	1999	Messages (consequences)	Attitudes (sex expectancies) Perceived norms (peer injunct.)	751	Age 14–17 100% AA 50% female 58% initiated sex	Random, community	Cross sectional, survey	OLS regression	PASC about consequences of sex (e.g., health risks, social costs) linked to greater awareness of those same consequences
Fisher (9)	1986	Overall extent	Attitudes (permissive)	141	Age 12–20 Ethnicity n/a 59% female Initiated sex n/a	Non-random, college and snowball	Cross sectional, survey	ANOVA	PASC unrelated to sexual attitudes

Table 1 continued

First author (ref. Table 2)	Yr.	PASC variable	DVs pertaining to framework	N	Sample characteristics	Sampling strategy	Study design	Analysis	Major findings pertaining to the conceptual model
Fletcher (10)	2015	Messages (values)	Self-efficacy (condoms)	631	Mean age = 19.7 100% AA 73% female 53% initiated sex	Non-random, college	Cross sectional, survey	OLS regression	PASC messages endorsing sex as normative, but not as strictly relational, predicts condom-use efficacy
Guilamo-Ramos (11)	2007	Messages (consequences)	Attitudes (sex expectancies)	668	Mean age = 13.0 63% Latino/a 52% male 11% initiated sex	Random, community	Cross sectional, survey	Logistic/OLS regression	PASC about specific consequences of sex (health risks, emotional costs) associated with greater awareness of consequences
Harris (12)	2013	Messages (safe sex)	Attitudes (permissive; condom use) Self-efficacy (condom use) Intentions for condom use Consistency of condom use	134	Ages 18–22 100% AA 100% male 90% sex. active	Non-random, community	Cross sectional, survey	Pearson R; OLS, Log., and NB regression	PASC associated with more favorable attitudes toward condoms, less permissive sexual attitudes, and greater condom use efficacy
Holman (13)	2015	Messages (safe sex)	Attitudes (permissive)	159	Ages 16–18 59% white 64% female 57% initiated sex	Non-random, school	Cross sectional, survey	OLS Regression	PASC predicted less permissive sexual attitudes
Hutchinson (14)	1998	Messages (safe sex)	Self-efficacy (condom use)	173	Mean age = 19.7 56% white 100% female 80% initiated sex	Random, statewide	Cross sectional, survey	Pearson R	PASC associated with greater condom use efficacy
Hutchinson (15)	2003	Messages (safe sex)	Attitudes (condom use) Perceived norms (parent injunc.) Self-efficacy (condom use; refuse sex) Condom use	219	Mean age = 15.5 68% AA 100% female 100% initiated sex	Non-random, community	Longitudinal, survey	Poisson regression; causal steps mediation	PASC associated with less unprotected sex 3 months later, which was mediated by greater condom use efficacy (but no mediation by condom attitudes or norms)
Hutchinson (16)	2007	Messages (safe sex)	Attitudes (permissive) Self-efficacy (communicate with partner)	488	Mean age = 18.3 100% AA 66% female 77% initiated sex	Non-random, college	Cross sectional, survey	Pearson R	PASC associated with less permissive sexual attitudes and greater efficacy to communicate about sex with a sexual partner
Hutchinson (17)	2010	Messages (safe sex)	Self-efficacy (condom use)	234	Ages 19–22 39% white 100% female 100% initiated sex	Non-random, community	Cross sectional, survey	Pearson R	PASC positively associated with condom use efficacy
Jaccard (18)	1998	Overall extent	Perceived norms (parent injunct.)	745	Ages 14–17 100% AA 50% female 58% initiated sex	Non-random, community	Cross sectional, survey	OLS/Logistic regression [†]	Less PASC associated with underestimation of mothers' disapproval of sex

Table 1 continued

First author (ref. Table 2)	Yr.	PASC variable	DVs pertaining to framework	N	Sample characteristics	Sampling strategy	Study design	Analysis	Major findings pertaining to the conceptual model
Kowal (19)	2004	Messages (safe sex)	Attitudes (conservative) Self-efficacy (condom use; communicate with partner, refuse sex)	297	M _{age} = 17.69 81% white 62% female 68% initiated sex	Non-random, school	Cross sectional, survey	OLS regression	PASC associated with less permissive sexual attitudes, greater efficacy to refuse unwanted or risky sex, greater efficacy to obtain and properly use condoms, and greater efficacy to communicate about condoms with partner PASC inconsistently related to attitudes and efficacy (depending on the message received)
Lefkowitz (20)	2007	Messages (varied); quality	Attitudes (conservative; condom use) Self-efficacy (condom use)	182	Ages 17–19 50% white 50% female 59% sexually active	Non-random, college	Cross sectional, survey	ANOVA; OLS and logistic regression	PASC linked to greater perceptions of birth control use and sexual activity among peers
Leland (21)	1993	Overall extent	Perceived norms (peer descriptive)	1033	Mean age = 15.4 60% white 51% male 43% initiated sex	Non-random, school	Cross sectional, survey	T test	Abstinence messages generally predict less efficacy to use condoms or communicate with partner, whereas sex positive messages predict greater efficacy in the same
Levin (22)	2012	Messages (values)	Self-efficacy (condom use, communication with partner)	332	Ages 17–22 74% white 57% female Initiated sex n/a	Non-random, college	Cross sectional, survey	OLS regression	PASC predicts greater condom use attitudes and condom use efficacy, which predict greater condom use intentions and actual condom use
Malcolm (23)	2013	Quality	Attitudes (condom-use) Perceived norms (parent injunc.) Self-efficacy (condom use) Condom intentions and use	171	Mean age = 14.9 100% latina/o 73.1% male 100% initiated sex	Non-random, clinical	Cross sectional, survey	SEM†	Extent and quality of PASC predicts safe sex efficacy
Mastro (24)	2015	Overall extent; quality	Self-efficacy (safe-sex generally)	209	Ages 17–21 93% white 61% female 79% initiated sex	Non-random, college	Cross-sectional, survey	OLS regression	PASC associated with greater abstinence values and abstinence intentions, PASC indirectly related to fewer sexual behaviors via values and intentions (girls only) PASC related to less permissive sexual attitudes
Miller (25)	1998	Quality	Attitudes (conservative) Abstinence intentions Sexual intercourse	473	Ages 12–14 93% white 50% female 2% initiated sex	Non-random, school	Longitudinal, survey	SEM	PASC associated with less permissive sexual attitudes later on (girls only), controlling for peer influences
Moore (26)	1999	Parents as first sex educators	Attitudes (permissive)	717	Ages 18–23 Mostly white 100% female Initiated sex n/a	Non-random college	Cross sectional, survey	ANOVA	
Nikken (27)	2013	Overall PASC	Attitudes (permissive)	528	Ages 12–17 97% dutch 51% female Initiated sex n/a	Non-random, community	Longitudinal, survey	SEM	

Table 1 continued

First author (ref. Table 2)	Yr.	PASC variable	DVs pertaining to framework	N	Sample characteristics	Sampling strategy	Study design	Analysis	Major findings pertaining to the conceptual model
Ragsdale (28)	2013	Overall PASC	Attitudes (sex expectancies)	914	Ages 13–18 72% white 52% male 16% initiated sex	Random, community	Longitudinal, survey	SEM	PASC unassociated with adolescents' perceived social and health-related risks and benefits of sex
Romer (29)	1999	Messages (safe sex)	Attitudes (condom use) Perceived norms (peer descriptive regarding condom use)	355	Ages 9–17 100% AA 51% female 29 and 63% initiated sex (girls and boys)	Non-random, community	Cross sectional, survey	OLS regression [†]	PASC associated with more favorable attitudes toward condom use, but unassociated with perceived peer prevalence of condom use
Romo (30)	2002	Observed message types	Attitudes (conservative) Sexual intercourse	55	Ages 12–15 100% latina/o 64% female Initiated sex n/a	Non-random, school and community	Longitudinal, observational	SEM [†]	Mothers' self-disclosure about dating and sex linked prospectively to more conservative sexual attitudes, which predicted delayed sexual intercourse
Sales (31)	2008	Messages (safe sex)	Self-efficacy (communicate with partner)	243	Ages 14–18 100% AA 100% female Initiated sex n/a	Non-random, intervention	Cross sectional, survey	Pearson R	PASC positively associated with self-efficacy to communicate about safe sex behaviors with new partner
Shoop (32)	1994	N/A	Self-efficacy (communicate with partner)	80	Ages 15–18 Ethnicity n/a 50% female Initiated sex n/a	Non-random, community	Cross sectional, survey	Chi Square	PASC associated with greater perceived ability to talk with a sexual partner about AIDS issues
Somers (33)	2011	Overall PASC	Attitudes (conservative) Self-efficacy (refuse sex)	194	Ages 12–15 100% A/Latino 54% female 18% initiated sex	Non-random, school	Cross sectional, survey	OLS regression	PASC with fathers (but not mothers) associated with more permissive sexual attitudes, PASC unassociated with efficacy to refuse unwanted sex
Somers (34)	2000	Overall PASC	Attitudes (permissive)	157	Ages 14–18 83% white 61% female Initiated sex n/a	Non-random, community	Cross sectional, survey	Canonical correlation [†]	Less PASC related to more permissive sexual attitudes
Treboux (35)	1995	Overall PASC	Attitudes (permissive) Sexual intercourse	263	Ages 14–22 85% white 100% female 53% initiated sex	Non-random, school	Cross sectional, survey	SEM	PASC predicted less permissive sexual attitudes for younger adolescents. Permissive sexual attitudes, in turn, were positively linked to sexual experience (for 9–10th grade adolescents only)
Werner-Wilson (36)	1998	Overall PASC	Attitudes (permissive)	1587	Ages 14–19 75% white 62% female Initiated sex n/a	Non-random, community	Cross sectional, survey	OLS regression	(a) Overall extent of PASC associated with more permissive sexual attitudes for girls. (b) Greater proportion of sexual information from parents associated with less permissive attitudes for girls

Table 1 continued

First author (ref. Table 2)	Yr.	PASC variable	DVs pertaining to framework	N	Sample characteristics	Sampling strategy	Study design	Analysis	Major findings pertaining to the conceptual model
Whitaker (37)	2000	Ever talked	Perceived norms (peer descript.)	907	Ages 14–16 52% latina/o 57% female 41% initiated sex	Non-random, school	Cross sectional, survey	OLS regression	PASC unassociated with perceptions of peer sexual activity and condom use
Wills (38)	2003	Messages (safe sex)	Perceived Norms (peer injunct.) Sexual intercourse	297	Ages 12–14 100% AA 53% female 25% initiated sex	Non-random, community	Cross sectional, survey	SEM†	PASC unassociated with adolescents' evaluative perceptions of their peers who have sex and who abstain from sex

Yr., Year published; PASC, parent–adolescent sexual communication; DV, dependent variable (higher scores indicated the construct in parentheses); N, sample size; AA, African American; SEM, structural equation modelling; n/a, information not reported; †, statistically adjusted for one or more family climate variable; Regarding types of regression; OLS, ordinary least squares, Log, logistic, NB, negative binomial, SU, seemingly unrelated; ANOVA, analysis of variance

permissive sexual attitudes for girls, but not for boys. Werner-Wilson (1998) reported that parent–adolescent sexual communication was significantly related to *less* conservative sexual attitudes for girls, but not for boys. Somers and Ali (2011) found that greater extent of fathers', but not mothers' parent–adolescent sexual communication was correlated with more permissive sexual attitudes. Bynum (2007) found that parent–adolescent sexual communication was associated with emerging adult daughters' *more* permissive sexual attitudes for African American, but not White, emerging adults. Somers and Paulson (2000) reported that *less* extent of parent–adolescent sexual communication was related to less permissive attitudes only among female adolescents ages 14–16. Romo et al. (2002) found that receiving messages of personal disclosure from mothers about her own romantic/sexual experiences (versus receiving cautions or advice) predicted daughters' more conservative sexual attitudes. Lefkowitz and Espinosa-Hernandez (2007) found that receiving more abstinence messages, but not messages regarding dating, sexual feelings, and the dangers of having sex, was significantly related to young adults' conservative sexual attitudes. Finally, in three studies, parent–adolescent sexual communication was unrelated to conservative and/or permissive sexual attitudes (Beadnell et al. 2007; Hutchinson et al. 2003; Fisher 1986).

Expectancies (Perceived Consequences) Three studies reported that parent–adolescent sexual communication was related to adolescents' greater awareness of the health consequences (e.g., could contract an STD) and emotional consequences (e.g., could feel guilty) of having sex (Bleakley et al. 2009), particularly when parents spoke specifically about these topics (Dittus et al. 1999; Guilamo-Ramos et al. (2007). One study found no association between parent–adolescent sexual communication and adolescents' sexual expectancies (Ragsdale et al. 2013).

Condom Related Attitudes In three studies, parent–adolescent sexual communication was significantly associated with adolescents' more favorable views of using condoms (Cederbaum et al. 2013; Malcolm et al. 2013; Romer et al. 1999). One study reported mixed findings: higher quality parent–adolescent sexual communication and receiving messages of condoms as preventative predicted more favorable attitudes toward using condoms in young adults; the reception of other messages (e.g., abstinence, dangers of sex) were unrelated (Lefkowitz and Espinosa-Hernandez 2007). One study reported a non-significant longitudinal association with condom related attitudes (Hutchinson et al. 2003).

Table 2 Summary table of pathways through which parent–adolescent sexual communication (PASC) influences adolescent sexual behavior**PASC predicting sexual attitudes, norms, self-efficacy, intentions**

Attitudes

Conservative Sexual Attitudes

- (+) Sexual Risk Communication related to adolescents' greater abstinence beliefs⁶
- (+) Sexual Risk Communication related to fewer perceived benefits of a proximal sexual experience¹⁶
- (+) Sexual Risk Communication related to less acceptance of casual sexual encounters¹²
- (+) Overall Extent of PASC associated with less acceptance of casual sex³⁵
- (+) When parents are first sex educators, adolescents hold less permissive sexual attitudes²⁶
- (+) Sexual Risk Communication related to more positive views of abstinence⁴
- (+) Higher Quality of PASC (sensitivity/openness) related to greater valuing of premarital abstinence²⁵
- (+) Sexual Risk Communication predicts less permissive sexual attitudes¹³
- (+) Sexual Risk Communication related to safer sexual attitudes¹⁹
- (0/+) Mothers' romantic disclosure, but not other messages, predicted conservative sexual attitudes³⁰
- (0/+) Abstinence messages, but not others, are associated with more conservative sexual attitudes²⁰
- (0/+) Overall extent of PASC longitudinally related to less permissive sexual attitudes for girls only²⁷
- (0/−) Overall extent of fathers' (but not mothers') PASC related to more permissive sexual attitudes³³
- (0/−) Less overall extent of PASC related to less permissive attitudes for only younger girls (ages 14–16)³⁴
- (0/−) Overall extent of PASC associated with *more* permissive sexual attitudes among African American (but not White) emerging adult women³
- (0/−) For girls only, overall extent of PASC related to less conservative sexual attitudes³⁶
- (0) Sexual Risk Communication not empirically related to permissive sexual attitudes¹
- (0) Overall extent of PASC unrelated to permissive sexual attitudes⁹
- (0) Sexual Risk Communication not longitudinally related to permissive sexual attitudes¹⁵

Sexual Expectancies and Perceived Consequences of Sex

- (+) Adolescents are more cognizant of sexual risks that are specifically addressed during PASC⁸
- (+0) Adolescents are more cognizant of health and emotional consequences of sex, but not hedonistic expectancies, when these topics are specifically addressed during PASC¹¹
- (+0) Parents as main sex educator associated with awareness of health risks, but not with perceived personal benefits²
- (0) Overall extent of PASC did not longitudinally predict any sexual expectancies²⁸

Condom Related Attitudes

- (+) Sexual Risk Communication associated with more favorable views of condoms⁴
- (+) Sexual Risk Communication associated with more favorable views of condoms²⁹
- (+) Higher Quality (e.g., comfortable and open) PASC associated with more favorable views of condoms²³
- (+0) Condom-related messages, but not others (e.g., abstinence) linked to more prevention expectancies²⁰
- (+0) Higher Quality (e.g., more comfortable and open) PASC associated with greater hedonistic expectancies around condoms but not prevention expectancies²⁰
- (0) Sexual Risk Communication not longitudinally related to condom attitudes¹⁵

Perceived sexual norms

Peer descriptive norms

- (+) Overall Extent of PASC linked with greater perceived sexual activity & birth control use among peers²¹
- (0) Parent(s) as primary source of sexual information not linked to perceptions of peers' sexual activity²
- (0) Sexual risk communication not linked to perceptions of peers' sex/condom use²⁹
- (0) Ever talked with parents about sex not linked to perceptions of peers' sex/condom use³⁷

Peer injunctive norms

- (+) Adolescents anticipate negative social consequences of sex (e.g., gaining bad reputation) when parents specifically communicate these topics⁸
- (0/+) Adolescents anticipate negative social consequences of getting pregnant, but not having sex, when parents specifically communicate these topics¹¹
- (0/+) Sexual risk communication predicts perceived approvability of condoms, but not abstinence, among peers⁴
- (0) Overall extent of PASC not longitudinally related to perceived social consequences of having sex²⁸

Table 2 continued

(0) Sexual risk communication unassociated with evaluative judgments of peers who are having sex and peers who abstain³⁸
 (–) Sexual risk communication associated with greater perceived approval of sex from others¹

Parent Injunctive Norms

(+) When overall PASC is low, adolescents underestimate degree of parents' disapproval of sex⁸
 (+) Adolescents perceive familial consequences of sex when parents specifically communicate them¹⁸
 (+) Adolescents perceive familial consequences of sex when parents specifically communicate them¹¹
 (+) Higher quality (e.g., more comfortable) PASC associated with greater perceived parental approval of condom use²³
 (0) Sexual risk communication not prospectively associated with maternal approval of sex and condom use¹⁵

Safe sex self-efficacy

Condom-use and safe sex communication efficacy

(+) Sexual risk communication predicts greater perceived ability to use condoms¹²
 (+) Sexual risk communication with mother correlated with greater condom use self-efficacy¹⁴
 (+) Sexual risk communication with mother correlated with greater condom use self-efficacy¹⁷
 (+) Sexual risk communication with mother predicts condom use self-efficacy¹⁵
 (+) Sexual risk communication predicts greater self-efficacy to negotiate safer sex with a partner⁵
 (+) Sexual risk communication predicts greater self-efficacy to communicate about safe sex with partner¹⁶
 (+) Sexual risk communication linked to greater self-efficacy to communicate about safe sex with partner³¹
 (+) Overall extent of PASC predicts greater likelihood of feeling able to communicate with partner about AIDS related issues⁷
 (+) Overall extent of PASC predicts greater safe sex communication efficacy with a sexual partner³²
 (+) Higher quality (e.g., more comfortable) PASC predicts greater condom-use efficacy²³
 (+) Sexual risk communication related to greater condom and safe-sex communication efficacy¹⁹
 (+) Overall extent of and higher quality PASC with mother related to greater safe sex competence²⁴
 (0/+) Messages endorsing sex as normative, but not as strictly relational, predicts condom-use efficacy¹⁰
 (0/+) Quality of PASC, but not actual content, predicts fewer perceived barriers to condoms²⁰
 (±) Abstinence messages related to less safe sex efficacy whereas sex positive messages related to greater safe sex efficacy²²
 (0) Sexual risk communication unassociated with adolescents' perceived ability to use condoms⁴

Efficacy to avoid or resist unwanted sexual encounters

(+) Sexual risk communication related to greater efficacy to refuse sex¹⁹
 (0) Sexual risk communication with mother unassociated with efficacy to avoid engaging in sex¹⁵
 (0) Sexual risk communication of PASC unassociated with efficacy to resist unwanted or unsafe sex⁴
 (0) Sexual risk communication of PASC unassociated with efficacy to avoid sex¹
 (0) Overall extent of PASC unassociated with efficacy to resist unwanted sex³⁴

PASC predicting intentions or behaviors via attitudes, norms, and self-efficacy

Attitudes

(+) Significant mediation of sexual risk communication and abstinence intentions by less permissive sexual attitudes⁴
 (+) Significant and strong mediation of quality of PASC and abstinence intentions via abstinence attitudes²⁵
 (+) Relation between quality of PASC predicts favorable condom use attitudes, which predicts greater condom use intentions and behaviors²³
 (+/0) Overall extent of PASC predicts delay of sexual intercourse via conservative sexual attitudes for younger adolescents only (ages 14–16)³⁵
 (+/0) Mothers' sexual disclosure, but not other topics of PASC, longitudinally predicts less sexual behavior via more conservative sexual attitudes³⁰
 (0) Sexual risk communication not related to number of days of unprotected intercourse 3 months later via condom-related attitudes¹⁵
 (0) Sexual risk communication does not predict sexual intentions via positive sexual attitudes¹

Perceived norms

(+) Sexual risk communication linked to peer norms of condom use, which predicts greater condom use⁴
 (0) Sexual risk communication unrelated to number of days of unprotected intercourse 3 months later via perceived maternal disapproval of sex¹⁵
 (0) Sexual risk communication not associated with sexual behavior via adolescent's prototypes of sexual "engagers" and "abstainers"³⁸
 (0) Higher quality PASC does not predict condom use via maternal approval of condom use²³

Table 2 continued

(–) Sexual risk communication related to greater sexual intentions via perceived approval of sex from others ¹
Self-efficacy
(+) Overall extent of PASC predicts condom use efficacy and communication efficacy, which predicts safe sex communication ⁷
(+) Quality of PASC predicts condom use efficacy which predicts greater condom use ²³
(+ / 0) Sexual risk communication longitudinally predicts fewer episodes of unprotected sex, but not number of sexual partners, via condom use efficacy ¹⁵
(0) Sexual risk communication does not predict sexual intentions via efficacy to avoid sex ¹

PASC, Parent–adolescent sexual communication; +, indicates significant link with protective indicator; –, indicates significant link with risk indicator; 0, indicates nonsignificant or null result

Perceived Norms

Perceived norms were examined in 13 studies. Of these, studies examined peer descriptive norms ($k = 4$), peer injunctive norms ($k = 6$), and parent injunctive norms ($k = 5$). Some studies assessed multiple norms.

Peer Descriptive and Injunctive Norms One study reported that parent–adolescent sexual communication significantly predicted adolescents' greater perceived prevalence of sexual intercourse and birth control use among their peers (Leland and Barth 1993). Three studies reported non-significant associations between parent–adolescent sexual communication and adolescents' perceptions of their peers' sexual activity (Bleakley et al. 2009; Whitaker and Miller 2000) and condom use (Romer et al. 1999; Whitaker and Miller 2000).

Six studies examined peer injunctive norms. One study found parent–adolescent sexual communication to significantly predict adolescents' greater perception of eliciting social disapproval by having sex (Dittus et al. 1999). Two studies reported mixed findings: receiving messages about the social consequences of having sex predicted adolescents' greater expectancies of social disapproval of getting pregnant, but not of having sex (Guilamo-Ramos et al. 2007). Cederbaum et al. (2013) reported greater extent of parent–adolescent sexual communication was associated with a greater perceived approvability of condom use, but not delayed intercourse, among peers. Two studies reported non-significant results between parent–adolescent sexual communication and adolescents' perceived social consequences and benefits of having sex (Ragsdale et al. 2013) and adolescents' evaluative judgments (positive or negative) of their peers who are having sex and their peers who are abstaining (Wills et al. 2003). Finally, one study reported that greater extent of parent–adolescent sexual communication was associated with greater perceived approvability of sex among peers (Beadnell et al. 2007).

Parent Injunctive Norms Four studies showed parent–adolescent sexual communication was significantly associated with parental injunctive norms, including greater perceived parental disapproval of sex (Dittus et al. 1999; Jaccard et al. 1998; Guilamo-Ramos et al. 2007) and greater perceived parental approval of using condoms (Malcolm et al. 2013). One study reported a non-significant longitudinal association between parent–adolescent sexual communication and perceived maternal approval of sexual intercourse and condom use (Hutchinson et al. 2003).

Self-Efficacy

Self-efficacy was examined in 18 studies. Specifically, studies examined condom-use and safe sex communication efficacy (perceived ability to acquire, use and/or talk to a sexual partner about condoms and other safe sex practices; $k = 16$), and efficacy to resist unwanted sexual encounters ($k = 5$). Some studies assessed both types of efficacy.

Condom-use and Safe Sex Communication Efficacy Twelve studies reported a significant relation between parent–adolescent sexual communication and adolescents' greater perceived ability to acquire and use condoms or contraceptives (Harris et al. 2013; Hutchinson et al. 2003; Hutchinson and Cooney 1998; Hutchinson 2010; Kowal and Blinn-Pike 2004; Malcolm et al. 2013; Mastro and Zimmer-Gembeck 2015), successfully negotiate the use of condoms with a resistant or new partner (DiClemente et al. 2001; Hutchinson and Montgomery 2007; Kowal and Blinn-Pike 2004), and to discuss health-related topics such as STDs and AIDS with a current or hypothetical partner (DiIorio et al. 2000; Sales et al. 2007; Shoop and Davidson 1994). Three studies reported mixed findings: Fletcher et al. (2015) found that receiving messages endorsing sex as normative predicted emerging adult women's greater condom-use efficacy, though messages endorsing sex as strictly relational or marital did not; Levin et al. (2012) reported that the reception of sex-positive

messages positively predicted condom-use and safe-sex communication efficacy in emerging adult men, but not women, and that the reception of abstinence messages predicted a *decrease* in the same for both emerging adult men and women; Lefkowitz and Espinosa-Hernandez (2007) reported that higher quality parent–adolescent sexual communication predicted fewer perceived barriers to using condoms, but receiving messages pertaining to dating, fertility issues, dangers of sex, and abstinence, were unrelated. One study found no empirical relation between parent–adolescent sexual communication and adolescents’ perceived ability to use condoms (Cederbaum et al. 2013).

Efficacy to Avoid or Refuse Sexual Encounters One study reported a significant relation between parent–adolescent sexual communication and adolescents’ greater efficacy to avoid or refuse unwanted sexual encounters (Kowal and Blinn-Pike 2004); however, four studies found this relation to be non-significant (Beadnell et al. 2007; Cederbaum et al. 2013; Hutchinson et al. 2003; Somers and Ali 2011).

Indirect Relations to Intentions/Behaviors via Attitudes, Norms, and Efficacy

Under the current framework, intentions and behaviors are modeled as being indirectly influenced via sexual attitudes, perceived norms, and self-efficacy. Generally speaking, attitudes and self-efficacy were more consistently implicated as the pathways of influence between parent–adolescent sexual communication and sexual intentions or behaviors. Little evidence emerged for perceived norms as an intervening mechanism.

Attitudes

Seven studies modeled sexual attitudes as intervening between parent–adolescent sexual communication and sexual intentions/behaviors. Three of these showed significant indirect effects, which are described as follows. Cederbaum et al. (2013) showed parent–adolescent sexual communication to significantly predict less permissive sexual attitudes, which in turn significantly predicted greater abstinence intentions. Malcolm et al. (2013) reported that higher quality sexual communication predicted more positive condom-use attitudes, which in turn predicted greater condom-use intentions and behaviors. Miller et al. (1998) showed that higher quality parent–adolescent sexual communication longitudinally predicted less permissive sexual attitudes, which then predicted later abstinence intentions, which in turn predicted abstinence. Two studies showed mixed findings:

Treboux and Busch-Rossnagel (1995) showed that the relation between parent–adolescent sexual communication and greater intentions to delay sexual intercourse was statistically mediated by more conservative sexual attitudes, but only for the younger portion of their sample (ages 14–15); Romo et al. (2002) found that receiving messages of maternal disclosure, but not other messages (e.g., beliefs and values) was related to lower levels of later sexual behavior, a relation that was statistically mediated by more conservative sexual attitudes. Two studies reported that sexual attitudes did not statistically mediate between extent of parent–adolescent sexual communication and adolescents’ sexual intentions (Beadnell et al. 2007) and sexual risk behavior (Hutchinson et al. 2003).

Perceived Norms

Perceived norms were modeled as intervening mechanisms in five studies. One study showed greater extent of parent–adolescent sexual communication to be associated with higher perceived norms of condom use, which in turn was associated with greater condom use intentions (Cederbaum et al. 2013). Three studies failed to show perceived norms statistically mediating the relation between parent–adolescent sexual communication and sexual intentions/behaviors: in two of these, maternal and peer norms were predictive of later safe sex behaviors, but were not actually associated with greater extent of parent–adolescent sexual communication (Hutchinson et al. 2003; Wills et al. 2003); Malcolm et al. (2013) found that higher quality parent–adolescent sexual communication predicted greater perceived maternal approval of condom use, but that maternal approval of condom use did not predict later intentions and behaviors. Finally, Beadnell et al. (2007) found that greater extent of parent–adolescent sexual communication was related to *increased* sexual intentions and behaviors, which was statistically mediated by more favorable peer norms toward sex.

Self-Efficacy

In four studies, self-efficacy was modeled as an intervening mechanism. In three studies, path models and/or mediation analyses showed that parent–adolescent sexual communication was related to greater efficacy to use condoms and to communicate with a sexual partner about safe sex practices, which were then associated with greater safe sex behavior (e.g., fewer sexual partners, fewer instances of unprotected sex) (DiIorio et al. 2000; Hutchinson et al. 2003; Malcolm et al. 2013). One study showed that parent–adolescent sexual communication was not indirectly related to sexual intentions via self-efficacy to refuse unwanted sex (Beadnell et al. 2007).

Communication Characteristics: Extent, Messages, and Quality

The conceptual model also suggests that the communication characteristics of parent–adolescent sexual communication may determine how effective it is in predicting adolescents' sexual attitudes, perceived norms, and self-efficacy. Of interest to the review was the overall extent, the content, and the quality of parent–adolescent sexual communication. A handful of studies assessed other topics, including parents as main sex educators ($k = 2$; 5%), parents as first sex educators, ($k = 1$; 2.5%), whether parent–adolescent sexual communication ever took place growing up ($k = 1$; 2.5%), and not described ($k = 1$; 2.5%).

Overall Extent of Parent–Adolescent Sexual Communication

Several of the studies assessed the overall amount of parents' sexual communication ($k = 13$, 33%). This involved assessing parent–adolescent sexual communication on a wide array of topics, but aggregating these for an overall score indicating how much sexual communication has taken place. The overall extent of parent–adolescent sexual communication predicted less permissive sexual attitudes in two studies (Nikken and de Graaf 2013; Treboux and Busch-Rossnagel 1995), more permissive attitudes in three studies (Bynum 2007; Somers and Ali 2011; Werner-Wilson 1998), and displayed no empirical relation to sexual attitudes in two studies (Fisher 1986; Ragsdale et al. 2013). Regarding perceived norms, it predicted greater perceived peer sexual activity (i.e., peer descriptive norms) in one study (Leland and Barth 1993), more perceived social consequences of sex in one study (i.e., injunctive norms; Dittus et al. 1999), greater parental disapproval of sex in one study (Jaccard et al. 1998), and was unrelated to peer norms in one study (Ragsdale et al. 2013). Finally, overall extent of parent–adolescent sexual communication was significantly related to greater safe-sex efficacy in three studies (DiIorio et al. 2000; Mastro and Zimmer-Gembeck 2015; Shoop and Davidson 1994) and unassociated with efficacy to refuse unwanted sex in one study (Somers and Ali 2011).

Messages Communicated

Nineteen (50%) studies examined specific sexual messages communicated by parents. For the most part, these included communication about the health risks of sex and safe sex practices (e.g., discussing STDs, birth control, condom use; $k = 14$, 36%). A handful of other studies examined communication about sex-related values ($k = 3$, 8%) and the

emotional/social consequences of sexual behavior, ($k = 2$, 5%).

Receiving messages about sexual risk and safe sex practices predicted less permissive sexual attitudes in six studies (Cederbaum et al. 2013; DiIorio et al. 1999; Harris et al. 2013; Holman and Kellas 2015; Hutchinson and Montgomery 2007; Kowal and Blinn-Pike 2004), more favorable condom-related attitudes in three studies (Cederbaum et al. 2013; Lefkowitz and Espinosa-Hernandez 2007; Romer et al. 1999), greater awareness of the health consequences of sex in two studies (Dittus et al. 1999; Guilamo-Ramos et al. 2007), and was unrelated to attitudes in two studies (Beadnell et al. 2007; Hutchinson et al. 2003). Regarding perceived norms, sexual-risk messages were linked to more perceived peer sexual activity in one study (Beadnell et al. 2007), though three studies found non-significant relations with perceived norms (Hutchinson et al. 2003; Romer et al. 1999; Wills et al. 2003). Regarding self-efficacy, eight studies linked sexual risk messages to greater condom-use and sexual communication efficacy (DiClemente et al. 2001; Harris et al. 2013; Hutchinson and Cooney 1998; Hutchinson et al. 2003; Hutchinson and Montgomery 2007; Hutchinson 2010; Kowal and Blinn-Pike 2004; Sales et al. 2007) whereas one study found this link to be non-significant (Cederbaum et al. 2013); one study linked sexual risk messages to greater efficacy to refuse unwanted sex (Kowal and Blinn-Pike 2004), although three studies found this relation to be non-significant (Beadnell et al. 2007; Cederbaum et al. 2013; Hutchinson et al. 2003).

Messages about sexual values were assessed in three studies and included abstinence and sex-positive values. Communication of abstinence values predicted more conservative sexual attitudes in one study (Lefkowitz and Espinosa-Hernandez 2007), but also failed to predict condom-related attitudes (Lefkowitz and Espinosa-Hernandez 2007) and safe-sex efficacy in others (Fletcher et al. 2015; Lefkowitz and Espinosa-Hernandez 2007; Levin et al. 2012). Sex-positive messages predicted greater safe-sex efficacy in one study (Levin et al. 2012), though it was unrelated to safe-sex efficacy in another (Fletcher et al. 2015). Finally, two studies found that messages about the emotional and social consequences of sex were related to adolescents' greater expectancies of these same consequences (Dittus et al. 1999; Guilamo-Ramos et al. 2007).

Quality of Parent–Adolescent Sexual Communication

Fewer studies ($k = 4$, 10%) examined the quality of parent–adolescent sexual communication, or the degree of comfort, openness, and respect during sexual conversations. Among these, higher quality parent–adolescent sexual communication predicted more conservative sexual

attitudes (Miller et al. 1998), more favorable condom attitudes (Lefkowitz and Espinosa-Hernandez 2007; Malcolm et al. 2013), greater perceived parental approval of condom use (Malcolm et al. 2013), and greater safe-sex efficacy (Mastro and Zimmer-Gembeck 2015). One study reported a non-significant relation between quality of parent–adolescent sexual communication and sexual attitudes (Lefkowitz and Espinosa-Hernandez 2007).

Discussion

Parent–adolescent sexual communication can help adolescents make healthier sexual decisions (Widman et al. 2015). However, sexual conversations are challenging for many families (Malacane and Beckmeyer 2016), and pediatricians and other helping professionals may seek to help parents more effectively tailor their sexual conversations with adolescents. The current review advances theory on parent–adolescent sexual communication by identifying pathways that explain how parent–adolescent sexual communication is associated with adolescents' sexual intentions and behaviors, as well as examining the characteristics of the communication that may contribute to its effectiveness.

Parent–Adolescence Sexual Communication and Pathways of Association with Sexual Intentions and Behaviors

The conceptual model guiding this study posits that parent–adolescent sexual communication predicts change in adolescents' sexual cognitions (i.e., attitudes, perceived norms, and self-efficacy), which in turn can influence their sexual intentions and/or behaviors. The reviewed studies provided support for several aspects of this model, particularly for pathways through attitudes and self-efficacy. Parent–adolescent sexual communication was consistently and empirically related to less permissive attitudes toward engaging in sexual intercourse, greater awareness of the various consequences of having sex, and more positive attitudes toward using condoms. Parent–adolescent sexual communication was also consistently linked to a greater perceived ability to buy and use condoms and to talk with sexual partners about healthy sexual practices, although studies did not necessarily report greater efficacy to avoid or refuse unwanted sexual behavior. A handful of studies then looked at how these cognitions, in turn, predicted sexual intentions or behaviors. These generally provided evidence that adolescents' sexual attitudes intervened between parent–adolescent sexual communication and adolescents' sexual intentions and behaviors (e.g., delayed intercourse). Similarly, several studies supported self-

efficacy as a mechanism of change, such that parent–adolescent sexual communication predicted greater safe-sex efficacy, which in turn predicted greater safe-sex intentions and behaviors (e.g., more consistent condom use).

Findings regarding perceived norms were mixed at best. Although parent–adolescent sexual communication was generally associated with greater perceived parental disapproval of having sex (parent injunctive norms), it was often unassociated with adolescents' perceptions of peers' sexuality (peer descriptive and injunctive norms). Not surprisingly, perceived norms often failed as an intervening mechanism to explain the relation between parent–adolescent sexual communication and sexual intentions/behaviors, as the majority of interested studies found these indirect paths to be non-significant. Of course, null findings must be interpreted with caution, and so concluding that parent–adolescent sexual communication is unimportant in this regard would be premature. Adolescents speak about sexual topics with their friends much more frequently than they do with their parents (Lefkowitz and Espinosa-Hernandez 2007), and so peer norms may be more strongly conveyed by peers themselves. Some research shows that parent–adolescent sexual communication may actually *moderate* associations between peer norms and sexual intentions and/or behaviors. In a recent longitudinal study, descriptive and injunctive peer norms predicted Dutch adolescents' greater intentions to have sexual intercourse (van de Bongardt et al. 2014). When controlling for these peer effects, parent–adolescent sexual communication had no relation to sexual intentions. However, for adolescents who reported more frequent sexual communication with their parents, both descriptive and injunctive peer norms were unassociated with their sexual intentions. This notion of parent–adolescent sexual communication as a buffer against peer sexual norms has been suggested in other studies (Whitaker and Miller 2000), and may represent a better pathway (than a mediated one) for understanding the role of parent–adolescent sexual communication in regards to adolescents' perceived peer norms around sexuality.

These findings represent the first systematic synthesis of the specific mechanisms of change through which parent–adolescent sexual communication is associated with adolescents' sexual intentions and behaviors, evidencing several theoretically coherent patterns. It should be noted, of course, that studies on a particular pathway or process were sometimes too few to draw definitive conclusions. As such, these findings should be considered preliminary, and more work is needed to further understand and verify these pathways of influence. Nevertheless, these findings can help orient researchers to the pathways by which parent–adolescent sexual communication can contribute to adolescents' sexual outcomes.

Communication Characteristics

This review was also the first to systematically summarize evidence, among a set of studies, for how the specific characteristics of parent–adolescent sexual communication (i.e., extent, content, quality) may influence its effectiveness in predicting adolescents' sexual cognitions. The most commonly assessed characteristic among the reviewed studies was content, and in particular messages about sexual risk and safe sex practices, which were examined in over one-third of the studies. With striking consistency, these safe-sex messages predicted more conservative/less permissive sexual attitudes and greater self-efficacy to enact safe sex practices. This contrasts somewhat with studies that assessed the overall extent of parent–adolescent sexual communication. For example, the overall extent of parent–adolescent sexual communication predicted less permissive attitudes, more permissive attitudes, and failed to predict attitudes with fairly equal frequency. Such inconsistencies are likely due, in part, to methodological limitations: measures of overall extent confound the specific topics discussed among families, lowering its overall predictive power (Lefkowitz 2002). Another explanation for these inconsistencies is that parents' general treatment of sexual topics with their adolescents may often fail to equip their adolescents with safe-sex competencies; safe-sex topics should be addressed specifically.

Other aspects of parent–adolescent sexual communication were examined, and although these studies were too few to draw definitive conclusions, they exhibit notable patterns that warrant future research. For example, abstinence messages, though predictive of less permissive sexual attitudes, were unrelated to other safe-sex competencies such as condom-related attitudes and efficacy. Research on broader sex education programs shows that adolescents receiving abstinence-only sex education may actually be more at risk for health-related consequences of sex (e.g., unintended pregnancy) than those who receive comprehensive sex-education (Kohler et al. 2008). Initially, a similar pattern appears to characterize parents' sexual communication; such findings should be followed up in relation to these social cognitive pathways specifically. Finally, studies in the review showed that higher quality parent–adolescent sexual communication (i.e., that was open, comfortable, and respectful) was typically associated with greater safe-sex self-efficacy and less permissive sexual attitudes. This dovetails with other research showing that lower quality sexual conversations (e.g., domineering, dismissive) predicts less sexual knowledge (Lefkowitz et al. 1998) and more sexual behavior in adolescents (Rogers et al. 2015). The implication is that the actual interpersonal dynamics of sexuality conversations

might influence the degree to which adolescents internalize parents' messages. Continued research representing these less studied characteristics is a fruitful avenue for future studies, which may help show how they produce meaningful variability in the effectiveness of parent–adolescent sexual communication.

In a similar vein, researchers should also bear in mind that these communication characteristics are not the only factors surrounding parent–adolescent sexual communication that can influence its effectiveness. Situational factors also matter a great deal. Two such factors that could produce variation in the reviewed pathways, but were not represented well enough among the reviewed studies for inclusion in the synthesis, include gender (of the parent and the adolescent) and the timing of parent–adolescent sexual communication relative to the child's sexual development. Greater evidence now indicates that parent–adolescent sexual communication is more predictive of sexual behaviors when mothers (versus fathers) are the source (DiIorio et al. 1999) and when daughters (versus sons) are the recipient (Widman et al. 2015). This likely represents different gender-based socialization around dating and sexuality (Perilloux et al. 2008). Parent–adolescent sexual communication may also be more effective among younger adolescents who are less sexually developed and who do not face the same social pressures around sexuality as do older adolescents (Beckett et al. 2010). Research should remain open to these (and other) situational features of parents' sexual conversations.

Limitations of the Reviewed Studies

The reviewed studies had a number of limitations that should be addressed in future work. A majority of the reviewed studies reported on cross-sectional data. As such, the directionality of effects cannot be determined. Operating under the present conceptual model, causal interpretations from parent–adolescent sexual communication to cognitions and from cognitions to intentions and/or behaviors can become taken for granted. The reader is reminded that the results of many of these studies can potentially be interpreted as proceeding in the opposite direction given the lack of longitudinal evidence and untested reciprocal relations. A reliance on cross-sectional data is also concerning for interpretations of indirect effects and statistical mediation. Such effects are best supported by temporally-ordered data, given that a mediated process assumes the passage of time as a sequence of events unfolds (Maxwell and Cole 2007), but this information is not provided by cross sectional data. Although this does not altogether invalidate interpretations of mediation, it is a stipulation that must be considered when making such interpretations. Longitudinal data on parent–adolescent

sexual communication can be particularly valuable in addressing these limitations.

Measurement issues were also of concern. Only seven of the reviewed studies (18%) used empirically validated measures, meaning that most measures of parent–adolescent sexual communication were idiosyncratic assessments developed by the studies' authors. This could create challenges in drawing conclusions across a body of literature, and so the continued development and use of empirically validated measures is a critical next step for research on parent–adolescent sexual communication. Future studies should also consider the value of observational methods, which can be particularly useful for understanding the dynamics of families' sexual conversations from a more objective lens (e.g., Rogers et al. 2015).

Finally, most studies did not account for other socio-contextual variables in their analyses. Parent–adolescent sexual communication is one influence among many, such as the general family climate, friends, and romantic partners, that can exert influence on adolescents' sexual cognitions and behaviors (Buhi and Goodson 2007; Huebner and Howell 2003). This omission is particularly concerning in regards to family climate variables, as parent–adolescent sexual communication is associated with more positive parenting in general (DiIorio et al. 2004). Thus, associations between parent–adolescent sexual communication and adolescent sexual outcomes could potentially be an artifact of the influence of more general family functioning. It should be noted that out of 10 studies that did account for one or more of these family climate variables, most found parent–adolescent sexual communication to still uniquely predict adolescents' sexual outcomes ($n = 9$). Still, future work would do well to more carefully account for these and other socio-contextual factors.

Limitations of the Present Review

The present review is also limited in a few ways. First, this review is not a representation of all studies on parent–adolescent sexual communication, but those that mapped on to the conceptual model (e.g., included an association with sexual cognitions). Readers should not conclude that these represent all the literature available. Relatedly, being guided by a specific framework, the review was sensitive to the theoretically delineated pathways of influence, but insensitive to other possible pathways, such as moderated relations (see van de Bongardt et al. 2014). Finally, the review used ten studies on emerging adult samples. Though they gave useful insight, emerging adulthood and adolescence are distinct periods, particularly in relation to sexual development. Research is needed to understand these indirect pathways differentially for adolescents and emerging adults.

Conclusion

This review makes a timely, theoretical contribution to the study of parent–adolescent sexual communication. Most scholarly attention is given to direct relations between parent–adolescent sexual communication and adolescents' sexual intentions and/or behaviors, and so little is known regarding the explanatory processes that account for these associations. The present review addresses this need by sensitizing researchers to the social-cognitive mechanisms through which parent–adolescent sexual communication might influence adolescents' sexual behavior, as well as the characteristics of that communication that can make it more or less effective over these social-cognitive mechanisms. The greater consideration of these explanatory processes in future studies, in addition to making key methodological improvements, can help advance scholarly research on parent–adolescent sexual communication and ultimately aid in the development of family-based prevention programs that aim to promote adolescents' sexual health.

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Conflict of interest The author declares having no conflict of interests.

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