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Parent-Child Sexual Communication and Sexual Risk: A Meta-Analytic Review

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PARENT-CHILD SEXUAL COMMUNICATION AND SEXUAL RISK: A META-
ANALYTIC REVIEW

by

Brittnie S. Peck

A Dissertation Submitted in
Partial Fulfillment of the
Requirements for the Degree of

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ABSTRACT

PARENT-CHILD SEXUAL COMMUNICATION AND SEXUAL RISK: A META-ANALYTIC REVIEW

by

Brittnie S. Peck

The University of Wisconsin-Milwaukee, 2020
Under the Supervision of Professor Mike Allen

This meta-analysis examines the effect of parent-child sexual communication (PCSC) on sexual risk behaviors and outcomes during adolescence. Results confirm that PCSC increases risk prevention strategies and reduces sexually risky behaviors with corresponding reductions in unplanned pregnancy and sexually transmitted infections (STI). Moderating variables include extent of communication, the content of PCSC interactions, operationalization of risk, timing of the interaction, biological sex of the adolescent, the dyadic composition of the parent-child interaction (e.g., mother-daughter, father-son), and the racial or ethnic makeup of the sample. The frequency, depth, and breadth of PCSC interactions, and inclusion of descriptive/instructional and contraception/risk information are associated with a reduction in sexual risk. PCSC appears most effective in promoting communication-based risk reduction strategies and barrier contraceptive use, and contributes to lower incidence of unplanned pregnancies. PCSC is moderately associated with composite safe sex or sexual risk scores, an important reminder to researchers that sexual risk manifestation varies distinctly at the individual level. PCSC in same-sex parent-child dyads is associated with lower levels of sexual risk than that in cross-sex dyads.

Thank you to my advisor, Dr. Mike Allen, for being patient and persistent, and for encouraging me to take on this behemoth back when I was still bright-eyed and bushy-tailed.

Dedicated

to

My fierce and loving mother, Carol,
for being proud of me in everything I do.

My sister, Morgan,
for always thinking the best of me.

My grandparents, William and Mary, for your unwavering support.

My son, Whalen Marion Dellinger,
for showing me life's truest purpose.

And finally, to my husband,

Dr. Jonathan B. Dellinger,

you have been the single greatest inspiration to me in all my life.

Thank you for holding me steadfast through each and every storm. I answer your call, and look forward to forever walking boldly into the future with you, side by side.

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Parent-Child Sexual Communication: A Meta-Analytic Review

Introduction

Over thirty years of surveying adolescents about sexual behavior identifies problem areas and trends in the improvement of recommendations for practice. According to the Center for Disease Control (CDC), from 1991 to 2011 the prevalence of sexual activity declined while overall condom use at the last reported sexual intercourse for adolescents increased (CDC, 2012). Taken together, the two trends in behavior indicate lower risk of exposure in the adolescent population lowering the incidence of sexual risk related outcomes (e.g., unintended pregnancy, sexually transmitted infection). Despite such breakthroughs, negative health, behavioral, and economic outcomes of risky sexual behavior remain a concern. The continued risks underscore a need to better understand sources of influence on sexual risk behavior (Coffelt & Olson, 2014). As of 2018 the U.S. Department of health and Human Services (CDC, 2019a) reported that half of all new STD diagnoses occurred between ages fifteen to twenty-four years of age. Additionally, about half of all sexually active high school students reported not using condoms during the last time sexual behavior (CDC, 2019b). Evidence shows parent-child sexual communication (PCSC) constitutes one key area of opportunity for influencing emerging adults to engage in less risky sexual behavior (e.g., DiIorio, Kelley, & Hockenberry-Eaton, 1999; Jaccard, Dittus, & Gordon, 1998; Miller, Kotchick, Dorsey, Forehand, & Ham, 1998).

A Review of Relevant Literature

Sexual Risk in Adolescents

The scope of adolescent sexual risk calls attention to a number of sexual risk factors with important implications for the physical, socio-emotional, and economic well-being of emerging adults. For example, condom use at last sex, a valid indicator of lifetime condom use and

correlate of sexual risk outcomes (Younge et al., 2008), remains low. According to data collected in 2013, of the 34% of adolescents reporting sexual activity in the three months prior, 40% reported not using condoms at last sexual intercourse (CDC, 2014a). The reported trends become interesting because while sexual activity among adolescents reported in the previous three months decreased from 34% in 2013 (CDC, 2014a) to approximately 30% in 2017, reported condom use decreased in that time, with 46% of adolescents reporting not using a condom at last sexual intercourse in 2017 (CDC, 2018).

A number of sexual risk outcomes occur at alarming rates; for example, childbirths to women aged 15-19 amounted to nearly 210,000 in 2016 (CDC, 2018), and people ages 15-24 account for over half of new STI diagnoses (sexually transmitted infection; e.g., chlamydia, gonorrhea, syphilis, trichomoniasis), amounting to over ten million each year (CDC, 2014b). Furthermore, despite a majority of 15-24 year-olds responding no concern about becoming infected with HIV, youth ages 13-24 accounted for 21% of new HIV diagnoses in the U.S. in 2011 (CDC, 2013). This rate remains steady, with 21% of all new HIV diagnoses occurring in those ages 13-24 as of 2017 (CDC, 2018). Rates of teen pregnancy consistently decreased since the mid-1960s, attributed to USFDA approval of the first oral contraceptive pill in 1960 (Planned Parenthood Federation, 2015). As of 2017 12.6% of women of reproductive age use some form of contraceptive pill, and 10.3% use a long-acting reversible contraception (IUD or implant) (CDC, 2018). As previously stated, however, consistent condom use among adolescents remains at about half, contributing to increases in STI diagnoses in this age group. For example, between 2017 and 2018 rates of syphilis cases in those ages 15-19 years increased 14.9%, and in those ages 20-24 years increased 10.3% (CDC, 2018). Taken together, the data indicate a gap in knowledge regarding STI and HIV prevention.

Gaps in information provided in sexual health education curricula can account for the overall decrease in sexual activity alongside increases in incidence of STIs and HIV in adolescents and emerging adults. Adolescent reports show a decline in receipt of formal sex education between 2006 and 2013 (Lindberg, Maddow-Zimet, & Boonstra, 2016). The estimate includes declines in receiving any formal information regarding birth control, STDs, HIV/AIDs, and addressing social pressure to have sex. Further, for the 80% adolescents reporting receiving sex education, only 55% of males and 60% of females report that education includes formal instruction about methods and use of birth control (Lindberg et al., 2016). This disparity in sexual health education topics is especially pronounced in rural areas, where less than half of young adults report receiving any instruction regarding methods of birth control (Lindberg et al., 2016). Additionally, for those who do report receiving formal education about contraception, only about half report that instruction included information on how to use a condom (Lindberg et al., 2016). In other words, for the relatively few adolescents receiving information about contraception, most are not receiving any instruction on how to properly use that contraception. About half of those adolescents also report that this instruction came after the first time they had sex (Lindberg et al., 2016).

Research overwhelmingly supports the relationship between comprehensive sexual education and desirable sexual health related outcomes. Specifically, delays in onset of sexual intercourse, lower rates of STDs and unintended pregnancies, reduced number of sexual partners, increased use of condoms or other contraceptives, as well as reports of healthier relationships with sexual partners (Chin et al., 2012). However, based on current information regarding adolescent experiences with sources of formal sexual health education, there are important gaps

in receipt of critical information. Additionally, once adolescents are outside of the classroom, the question of where they can turn to for reliable sexual health information remains.

Adolescents need access to a more comprehensive repertoire of sexual health information than what is made available in formal education contexts. The vast majority of adolescents report having talked with a parent about sexual health topics (Lindberg et al., 2016). In fact, adolescents report that their parents are the single most influential source on the decisions they make regarding sexual health (The National Campaign to Prevent Teen and Unplanned Pregnancy, 2012). However, there exist a number of barriers to parents as a reliable, accurate, and consistent source of sexual information. Many parents report anxiety and apprehension related to discussing sexual health with children providing a significant deterrent to holding such conversations (Ashcraft & Murray, 2017). Parents fearful of the ability to provide children with a comprehensive understanding of sexual health topics due to real or perceived ignorance (Ashcraft & Murray, 2017). Specifically, parents identify not knowing the answers, not using correct language or sounding crude, giving inaccurate information or being corrected, or providing information that is inconsistent from what another parent or adult has provided as barriers to engaging in sexual health conversations with their adolescents (Ashcraft & Murray, 2017). The parental belief is not only a perception of ignorance, however; evaluations of parents' baseline sexual health knowledge prior to viewing a campaign promoting parent-child sexual health conversations show parents do lack the knowledge required to provide their children with a comprehensive overview of sexual health education topics (DuRant, Wolfson, LaFrance, Balkrishnan, & Altman, 2006). Despite this barrier, parents remain arguably the most important source of sexual health information for their children.

The present meta-analysis examines parent-child sexual communication (PCSC) as a point of intervention, an important source of influence on adolescent sexual beliefs, behaviors, and ultimately, risk outcomes. Specifically, meta-analytic data identifies distinct dimensions of PCSC as risk or protective factors for sexual risk behaviors and outcomes. Ultimately, these data aids in development of prescriptive guidelines for how and when to engage in PCSC, maximizing its potential as a source of positive influence on adolescent sexual health.

Social Development Model

Preventing adolescent sexual risk involves a targeted assessment of factors that predict the likelihood of engaging in sexually risky behaviors (Kim, Oesterle, Catalano, & Hawkins, 2015). The Social Development Model (SDM) provides a predictive framework assessing protective factors, those which reduce the likelihood of engaging in risky behavior and increase the likelihood of preventative behaviors (Catalano et al., 2012). Protective factors (i.e., prosocial family involvement) identified in the SDM change over time, declining during middle school (Kim et al., 2015). The period in social development which occurs during middle school marks that directly prior to sexual onset for most adolescents, with mean age of first intercourse 16.51 years ($SD = 2.9$; Vasilenko, Kugler, & Rice, 2016). SDM highlights the role of parental influence as a protective factor against risky behaviors, emphasizing the importance of bonding to the prosocial family (Allen, Donohue, Griffin, Ryan, & Turner, 2003). Messages of PCSC are especially influential here, where children's curiosity about sexuality is piqued and sexual development is well underway. However, middle school becomes the time where children differentiate as individuals from the parents/family.

With the attempt to gain autonomy and establish individual and social identities during adolescence, the influence of family decreases (Arnett, 1999). Unless families establish a pattern

of open, honest discussion about sexual topics, that which encourages and rewards question asking, children will seek information about sexual topics elsewhere or not at all. Sexual information seeking may even involve engaging in direct experience. Sexual knowledge may be sought from less- or ill-informed sources, such as peers or online sources. It is also during middle school that peer influence and cultural influence increase (Arnett, 1999), thus such messages influencing risky sexual behavior are more potent.

PCSC as a Protective Factor

Parents and the family provide the primary means of socialization, the origin for health-related behaviors that are reflective of attitudes, beliefs, and habits shaped during childhood and lasting through adulthood (Tinsley, 1992). Sex remains a topic of conversation approached with relative infrequency between parents and children (Jaccard, Dittus, & Gordon, 2000). Both parents and children report discomfort with PCSC, often deemed a private or personal matter, as the primary reason for not engaging in more conversation about sexual topics. The reported discomfort and framing of sex-related topics as private and even inappropriate for discussion with children explains the low frequency for the topics of conversation (Blake, Simkin, Ledsky, Perkins, & Calabrese, 2001; Byers, Sears, & Weaver, 2008; Jaccard et al., 2000; Jerman & Constantine, 2010).

General family communication characterized as open and honest predicts beneficial sexual outcomes in adolescents, including decreased sexual risk behavior and more positive sexual attitudes (e.g., Kotchick, Dorsey, Miller, & Forehand, 1999; Kotva & Schneider, 1990). More specifically, children from families wherein communication is engaged with relative frequency about a variety of topics are encouraged and rewarded to engage in conversation. An

emphasis on family communication as dyadic in nature begets mutual disclosure and open discussion because children feel their perspectives are valued contributions to family life. The mutually influential dynamic within such parent-child relationships encourages bonding to the prosocial family, and thus children regard their parents as a trustworthy source of information and feedback.

Reports of the findings examining the impact of family sexual communication remain inconsistent. The majority of studies report a negative relationship between PCSC and sexual risk behaviors (e.g. Brown et al., 2008; Grossman et al., 2008; Harrison et al., 2012). PCSC predicts engaging in fewer sexual risk behaviors with less frequency (e.g. Trejos-Castillo & Vazsonyi, 2008; Whitaker & Miller, 2000). Yet, some studies show no relationship between sexual outcomes and PCSC (e.g. Aronowitz, Rennells, & Todd, 2005). Some studies find PCSC positively associates with the likelihood of sexual activity, earlier age of onset (e.g. Calhoun & Friel, 2001), and negatively associates with condom use (Deardorff et al., 2010; Hart & Heinberg, 2005); this is notable because age of onset and number of sexual partners are often identified as important sexual risk factors due to increased exposure alone, and a number of studies demonstrate sexual communication factors as key in increasing condom use among adolescents (Brown et al., 2008).

Such findings suggest PCSC might sometimes function as a risk rather than protective factor. Clawson and Reese-Weber (2003) found the extent of PCSC is positively correlated with the number of sexual partners, while negatively with the age of first sexual intercourse. This is consistent with the socialization perspective, which operates under the premise that children learn attitudes and behaviors regarding sex and sexuality early on in life from adult role models, most often their parents or primary caregivers (Clawson & Reese-Weber, 2003). In the case of

PCSC, the information parents share with their children and the attitudes conveyed during such interactions are thought to be highly influential, particularly when those messages are conveyed prior to adolescence, when peer influence begins to rise and parental influence decreases (Allen et al., 2003)

Alternatively, longitudinal data examining the relationship between virgin/non-virgin status and frequency of PCSC showed children perceiving more involved sexual communication with their parents maintained virgin status longer (Karofsky, Zeng, & Kosorok, 2001). Despite inconsistency in the field of PCSC research, sexual communication skills are a major focus in development of youth/adolescent sexual health intervention programs (DiClemente et al., 2009; Tortolero et al., 2010). Overall, different dimensions of PCSC may influence sexual behavior distinctly, such that frequency and extent of communication, both in terms of depth and breadth of topics, vary in their relationship to sexual behavior outcomes. The body of literature identifies five distinct dimensions of PCSC, each potentially influencing different sexual risk factors uniquely: (a) extent of communication (measurement varies in terms of both depth and breadth); (b) content of communication; (c) timing of communication; (d) general family environment; and (e) style in which sexual information is conveyed. Meta-analysis allows assessment of the extent to which each dimension acts as a protective factor against specific sexual risk factors (Warren & Warren, 2015). While PCSC has received considerable attention as a protective factor in encouraging safer sex behavior and decreasing risky sexual behavior among adolescents, the entirety of this body of literature, including the various forms of safe sex and sexual risk behaviors, as well as the plethora message characteristics which distinguish PCSC interactions, has not been empirically synthesized. Thus, the goals of the present meta-analysis are as follows:

a) first, the empirical synthesis of this body of literature allows for a more accurate estimation of

the magnitude of the association between PCSC and sexual risk behaviors, safe sex behaviors, and sexual risk outcomes; b) second, given the inconsistency in effect sizes demonstrates in this body of literature, the present meta-analysis will examine several potential moderator variables highlighted as important in the extant literature; c) finally, this meta-analysis seeks to highlight the complexity of PCSC messages as well as the notion that not all aspects of sexual risk associate equally with PCSC—both important contributors to the heterogeneity of findings in this body of literature.

Approaches to Studying PCSC

Most approaches to investigating PCSC employ cross-sectional design, although a few studies report longitudinal data. Overall, reported impact and magnitude of effects appear inconsistent and weak (Isaacs, 2012; Jaccard & Dittus, 1993). Inconsistency in the conceptual and operational definitions of variables potentially contributes to some of this disagreement. The operationalized extent of PCSC becomes defined in terms of amount, frequency, comfort, competence, ease, need, quality, satisfaction, receptiveness, responsiveness, and even perceived attitude. The variation in dimensions of measurement of PCSC spanning the body of literature is not considered by individual studies; many of these studies purport to measure the same variable (i.e., parent-child sexual communication) while the measurement reflects distinct dimensions of the construct.

There also exists inconsistency in the operationalization of sexual risk behaviors, sometimes only measuring rates of STI diagnoses or unplanned pregnancies, consistency in condom use, lifetime condom use, oral/implant contraceptive use, number of sexual partners, or age of sexual activity onset. Some of these measures (e.g., Furstenberg, Herceg-Baron, Shea, & Webb, 1984; Gillmore, Chen, Haas, Kopak, & Robillard, 2011; Miller, 2002) reflect risk in

terms of exposure (e.g., condom use, number of partners), while others (e.g., Scaramella, Conger, Simons, & Whitbeck, 1998) reflect sexual risk outcomes (e.g., incidence of STIs, adolescent pregnancy). When considering health related behaviors and associated outcomes, risk conceptualizes as “the probability that a particular outcome will occur following a particular exposure,” (Burt, 2001; Last, 2001). However, not all risk factors are directly causally related to specific health risk outcomes and not all risk factors affect all members of an at-risk population. Rather, some risk factors are peripherally associated with a particular outcome. Further, while some risk factors are behavioral in nature, and can therefore be modified to reduce chance of exposure, other factors are demographic features and thus immutable. Presence of a single risk factor in an individual does not necessitate a particular outcome, nor does a particular factor always result in a particular outcome. As such, the definition of a risk factor is necessarily broad:

An aspect of personal behavior or lifestyle, an environmental exposure, or an inborn or inherited characteristic which on the basis of epidemiological evidence is known to be associated with health-related condition(s) considered important to prevent. (Last, 2001, p. 251)

Concurrently, all present risk factors allow assessment of individuals in terms of an overall risk profile, taking into account both the risk and protective factors to determine probability of a risk outcome. In identifying and assessing potential points of intervention, however, one must consider each factor individually in terms of causal role, strength of association, and modifiability (Burt, 2001).

Few communication scholars examine the association between PCSC and sexual risk; the majority of studies are conducted by public health or developmental psychology scholars (Wright, 2009). Lack of coordination across disciplines likely contributes to inconsistent

operationalization and conceptual focus of communication variables within this body of scholarship. Disciplines outside of communication underestimate the complexity of the communication process (Coffelt & Olson, 2014; Isaacs, 2012; Wright, 2009); conflation of message characteristics, quality of communication, and extent of communication is well-demonstrated in the PCSC literature. Few studies provide a theoretical explanation for any observed relationship, limiting the understanding of the mechanisms through which PCSC influences sexual behavior and attitudes in emerging adulthood and beyond. For these reasons this body of literature remains stagnant. Little meaningful variation in approach to the same general question, along with conflation of distinct dimensions of communication, and inconsistent operationalization has resulted in inconsistent findings regarding the nature of this relationship (Warren & Warren, 2015). The proposed meta-analysis employs a theoretical foundation for understanding how patterns in PCSC explain and predict sexual risk factors (i.e., beliefs, values, attitudes, behaviors, and outcomes).

Meta-Analytic Review of PCSC and Associated Sexual Outcomes

This vast body of literature spans decades and has sought to understand the role of parental communication in sexual behaviors and attitudes in emerging adulthood. Without a useful theoretical perspective for framing the various dimensions of talk measured, it is difficult to make sense of this program of research as a whole. As noted by Warren and Warren (2015), an empirically tested theoretical model of family sexual communication does not exist. Further, few studies of PCSC invoke any theoretical framework as an explanatory or predictive tool; research has primarily focused on sexual risk outcomes associated with various dimensions of talk (Coffelt & Olson, 2014; Warren & Warren, 2015).

Coffelt and Olson (2014) introduced but did not test a teleological model of PCSC. Furthermore, the explanatory scope of this model extends only to parent-child relationships wherein sexual communication successfully occurs during multiple, distinct communication episodes over time. Situated within a communication privacy management (CPM) framework, this model integrates extant literature and empirical findings across disciplines to explain mutual, incremental sexual disclosures as contributions to a larger sexual discourse between a parent and child over time within the context of boundary management. While the CPM model provides insight to the process and role of sexual self-disclosure within the context of a parent-child relationship as a mutually influential dyad, the model fails to integrate the “complex, hierarchically integrated mental representations that family members have of themselves, their family members, and their family relationships” (Koerner & Fitzpatrick, 2006, p. 63). PCSC involves more than a matter of boundary management, regardless of whether the model accounts for relational change over time. A more complete theoretical model accounts for the role of cognition, about the self, family, and the relationship, to explain how co-orientation contributes to a family’s shared social reality (Koerner & Fitzpatrick, 2006).

The general family communication patterns theory (FCP; Koerner & Fitzpatrick, 2006) offers a useful theoretical framework for situating more specialized family communication theories and allows for examination of dimensions of PCSC concurrently (Warren & Warren, 2015). A family communication patterns framework accounts for observable differences in behavior and to explain the source of these differences (Koerner & Fitzpatrick, 2006), which further allows for predictions regarding “communication as a mediator of sexual attitudes and behavior” (Warner & Warner, 2015, p. 196). FCP provides a predictive framework for

understanding contributions of parent-child sexual communication to the social development model.

Family Communication Patterns Theory

Family Communication Patterns theorists (Koerner & Fitzpatrick, 2006) explain the unique value and belief systems, or schemata, which characterize a family unit emerge from interaction patterns between parents and children. These schemata influence how individuals come to perceive and interact with their social environment. FCP theory specifically explains family communication behavior is directly influenced by cognitive processes regarding message production and interpretation. The messages become filtered through family relationship schemas defining a “family” means and ought to communicate with one another.

Those schemas constitute a shared social reality and develop as a result of previous interactional experiences and knowledge, evident in communication patterns which vary according to conformity and conversation orientations (Koerner & Fitzpatrick, 2002). Whether or not parents encourage open, honest discussion and questioning about certain topics impacts our knowledge and understanding of those topics as adults. These schemata regarding sex and sexuality are reflected in the way parents talk to children about sex-related topics, including how much, how often and at what point during the child’s life to discuss certain topics, if those topics are even broached at all.

Researchers identify several key characteristics of parent-child sexual communication that contribute to an adolescent’s attitudes and behaviors regarding sexual topics (Lefkowitz & Stoppa, 2006). Characteristics include the age at which the parents begin discussing sex with children, the breadth and depth of topics discussed, and the frequency of sexual discussions. To that end, a family’s conversation orientation will be reflected in the amount of comfort in

discussing sexual topics as well as the breadth, depth, and frequency of such conversations. In other words, those families high in conversation orientation, wherein open and honest discussion about topics of a sexual nature is encouraged, are more likely to discuss sexual topics more frequently and to a greater extent. Family conversation orientations are reflected in the coding of studies in the proposed meta-analysis, such that those reporting: (a) a greater extent of sexual communication (i.e., depth of conversations), (b) greater number of topics in terms of content (i.e., breadth of conversations), (c) earlier age at which such conversations take place (i.e., prior to age of sexual onset), and (d) greater frequency with which such conversations take place, can be typified as families high in conversation orientation.

The family's conformity orientation, on the other hand, is reflected in *how* sex and sexuality are discussed (Jaccard & Dittus, 1993). Because sex and sexuality are typically considered private or uncomfortable topics of discussion, whether or not children feel comfortable questioning or engaging in open discussion with their parents is also indicative of a family's conformity orientation. Furthermore, families high in conformity orientation might be more likely to discuss sexuality only in terms of traditional and conservative attitudes and values (Raffaelli, Bogenschneider, & Fran Flood, 1998). A family's conformity orientation, especially when it comes to communicating about sex and sexuality, might actually shape that family's conversation orientation toward such topics.

While multiple qualitative reviews of this area of literature exist (e.g., Miller & Moore, 1990; Warren, 1995; Wright, 2009), a simple description of the content of a body of literature does not provide any accurate estimation of construct-level relationships observed in the population (Hunter & Schmidt, 2004). One recent meta-analysis of the relationship between PCSC and safer sexual behavior in adolescents (Widman, Choukas-Bradley, Noar, Nesi, &

Garrett, 2016) did establish strong empirical evidence for a consistent relationship between the variables of interest ($r = 0.10$; 95% CI [0.08, 0.13]. Widman and colleagues note the relationship between PCSC and safer sexual behavior is stronger for girls ($r = 0.12$) than boys ($r = 0.04$), and is stronger for those engaging in PCSC with their mothers ($r = 0.14$) than their fathers ($r = 0.03$). While results of this particular study did not show differences in the relationship between PCSC and condoms versus other types of contraceptives, or between longitudinal versus cross-sectional studies, a number of questions regarding possible moderating variables remain. Meta-analytic procedures allow empirical estimation of relationships, all while correcting for sampling error and other methodological artifacts that distort the results of a single study. In terms of theory building, meta-analysis allows for synthesis of the relationship between theoretical constructs and empirical evidence (Yang, 2002).

The present meta-analysis evaluates PCSC in terms of dimensions of communication situated within the theoretical framework of the social development model, with important implications for family communication patterns as well. Specifically, social development model provides a predictive framework for understanding the effects of PCSC over time, emphasizing the importance of multiple PCSC conversations over time that cover a variety of topics and allow for children to ask questions. This desirable pattern in PCSC and subsequent effects are explained by family communication patterns, which provides an additional predictive framework to apply in future research, and in understanding the importance of analyzing PCSC in terms of the five dimensions by which it varies.

Generally, a negative association between PCSC and sexual risk was predicted, such that (a) greater extent of communication, (b) more varied types of content (greater number of categories broached), (c) earlier timing of communication, (d) greater frequency of

conversations, as well as (e) family environments and (f) styles of conversation characterized as open, honest, and dyadic in nature were expected to associate negatively with sexual risk during emerging adulthood. However, timing of communication in particular was expected to account for the variance observed across studies, such that the relationship between PCSC and sexual risk is moderated by whether PCSC occurs prior to or after first intercourse (Korofsky, Zeng, & Kosorok, 2001). That is, the earlier age at which communication occurs, the greater the predicted effect size between PCSC and sexual risk.

Additionally, the operationalization of sexual risk was predicted to have a moderating, or perhaps even mediating, effect. Specifically, sexual risk factors that possibly reflect more sex positive attitudes (e.g., having had sexual intercourse at the time of survey) will act to decrease the strength of the relationship between PCSC and sexual risk, or perhaps change the direction of the relationship entirely depending on the operationalization of the outcome variable. Adolescents might report, for example, a greater number of sexual partners, but more consistent condom use. While both of these outcome variables are indicators of sexual risk, they must be considered separately, and are accounted for in coding of individual studies.

The following hypotheses were proposed:

H1a: There is a negative association between PCSC and sexual risk behavior and outcomes.

H1b: The relationship between PCSC and sexual risk is moderated by message, communicator, and study characteristics.

H2: The extent of sexual communication moderates the relationship between PCSC and sexual risk, such that (a) more in-depth, (b) frequent, and (c) PCSC

covering greater breadth of topics would strengthen the observed relationship between PCSC and sexual risk.

H3: The content of PCSC moderates the relationships between PCSC and sexual risk, such that the relationship between content of PCSC and sexual risk is strongest when PCSC covers information related to contraception and risk; followed by PCSC regarding descriptive or mechanical topics; relational, emotional, and social topics; and finally, the strength of this relationship is lowest when PCSC is characterized as a general sex talk.

H4: Timing of PCSC moderates the relationship between PCSC and sexual risk, such that PCSC occurring prior to onset of sexual activity strengthens the negative relationship between PCSC and sexual risk.

H5: The operationalization of sexual risk has a moderating effect on the relationship between PCSC and sexual risk.

H6: Biological sex of the child/adolescent moderates the relationship between PCSC and sexual risk, and the negative relationship between PCSC and sexual risk is stronger for girls than for boys who engaged in PCSC.

H7: Dyadic composition moderates the negative relationship between PCSC and sexual risk, such that the association between same-sex PCSC dyads and sexual risk is stronger than effects reported of PCSC dyads with an unspecified dyadic composition, and stronger than cross-sex dyads.

H8: The Racial/Ethnic makeup of study sample moderates the negative relationship between PCSC and sexual risk.

Methods

Eligibility Criteria

The present meta-analysis includes peer reviewed articles, dissertations, and other available unpublished manuscripts that met the following criteria: (a) quantifiable measurement of child- or parent-reported PCSC, (b) quantifiable child-report of sexual behaviors, (c) statistical test of the relationship between PCSC and behavior or risk outcomes. Studies testing the specified relationships were not included if results between the two specified variables were not recoverable.

Search Strategy and Information Sources

The search for relevant literature began with a general search of the library collections. Existing reviews were used as a source for identifying additional literature, and as for guidance in identifying key issues in the literature (Coffelt, & Olson, 2014; DiIorio, Pluhar, & Belcher, 2003; Flores & Barroso, 2017; Isaacs, 2012; Warren, 1995; Wright, 2009). The reference sections of these articles were combed to identify additional studies for inclusion, followed by a keyword search of databases according to the protocol described by previous reviews. The keyword search began with a general search of the UW-Milwaukee Libraries collection, and then a search in *Communication and Mass Media Complete*, *PsycInfo*, *PsycArticles*, *Academic Search Premiere*, and *EBSCO* databases. Keyword terms included various combinations of the following: family, sex, communication, sexual, education, parent-child, parent-adolescent, parent-teen, sexual risk, contraceptive use, safe sex.

Variables Included/Data Items

Each study measure of PCSC was coded based on six dimensions of talk identified by previous reviews (Coffelt & Olson, 2014; Jaccard, Dittus, & Gordon, 1998): 1) extent (depth,

breadth, or frequency) of communication, 2) content of the communication, 3) timing of the communication, and 4) Sexual Risk Measure (Dependent Variable). Data regarding general family environment, tone of conversation were generally unavailable, and were thus not included as moderator variables in the present analysis. Content/topic of communication was further coded regarding the following categories: 1) Descriptive/Mechanical, 2) Relational/Emotional/Social, 3) Medical/Contraception/Risk, and 4) General “Sex Talk.” If the measure included items spanning multiple categories, this was indicated by the coding scheme. Outcome measures were distinguished in terms of risk behavior (e.g., consistency in condom use, number of sexual partners), and/or risk outcome (e.g., unintended pregnancy, STI diagnosis). Studies were also coded according to specification of dyad composition; for example, some studies report PCSC specific to mother-child, mother-daughter, father-son, father-daughter, etc.

A number of demographic characteristics identified in extant literature as influential of communication styles were also included for analysis purposes, including race or ethnicity, and sex/gender of child and/or parent. (Warren & Warren, 2015). Cultural-group and socioeconomic status were typically not available, but qualitative record of distinguishing sample characteristics was kept. Each study was evaluated for any novel study characteristics that might contribute to observed relationships. For example, a number of studies collected data from individuals undergoing treatment for, or who had previously been diagnosed with STIs; some samples were distinctly urban or rural based. In other words, some of the sample populations were identified as particularly at-risk populations.

Coding of Data

A second coder independently reviewed the first half of the articles collected for examination. Both the author of this study and the second coder determined eligibility of each of the articles, as well as categorization according to each of the potential moderator variables. In any case where agreement did not occur, both coders discussed characteristics of the study until consensus was achieved. As mentioned previously, there were a number of study characteristics identified in extant literature as potentially important moderator variables (e.g., general family environment, style of communication); however, upon examination of the included studies these factors were not actually measured, and thus dropped out of the coding process.

The coding scheme directly accounts for various characteristics of PCSC conversations, as well as factors which exert additional influence on sexual behavior outcomes (see Table 1, p. 21). Directly coding for the different dimensions of talk contextualizes existing measures of PCSC. While extant literature does not allow for the synthesis of data within the context of Family Communication Patterns, results can be viewed through this theoretical lens and applied toward future research design. Present findings become interpreted by how they reflect conversation and conformity orientations. Inferences regarding how existing PCSC measures reflect operational definitions of FCP have important theoretical implications for this framework's explanatory and predictive capacity with regard to PCSC. Examining the diverse measures provides insight for how existing FCP framework can integrate a sexual communication-specific framework; such a model allows for estimation of communication as a mediator of sexual behaviors (Warren & Warren, 2015).

Table 1

Moderator Coding Key

<u>Extent of Communication</u> 1 = Depth/Frequency 2 = Breadth 3 = Any Talk 4 = Combination Depth and Breadth	<u>Racial/Ethnic Description of Sample</u> 1 = Representative sample 2 = Majority White/non-Hispanic sample 3 = Purposive Black/African American sample 4 = Purposive Hispanic/Latino sample 5 = Purposive minority race/ethnicities sample 6 = Purposive half Black/half White sample
<u>Content of Communication</u> 1 = Descriptive/Mechanical 2 = Relational/Emotional/Social 3 = Medical/Contraception/Risk 4 = General talk about sex-related topics 5 = Multiple topics covered	<u>Biological Sex of Sample</u> 1 = Female 2 = Male 3 = Mixed sex sample
<u>Timing of Communication</u> 1 = Pre-onset of sexual activity 2 = Post-onset of sexual activity 3 = Not specified	<u>Dyadic Composition</u> 1 = Parent-child 2 = Parent-daughter 3 = Parent-son 4 = Mother-child 5 = Mother-daughter 6 = Mother-son 7 = Father-child 8 = Father-daughter 9 = Father-son
<u>Operationalization/Measure of Risk (Dependent Variable)</u> 1 = Sexual behavior 2 = Barrier contraceptive use 3 = Other contraceptive use (e.g., oral birth control pill) 4 = Communication based outcome 5 = Composite safe sex or risk index 6 = STI diagnosis 7 = Unplanned pregnancy	

Moderator Variable Coding

Extent of communication characterizes operationalization of PCSC in much of the extant literature, such that measurement of PCSC as an independent variable is often conceptualized in terms of the extent of communication that has occurred. However, extent of communication is not consistently operationalized across the body of PCSC literature. As a moderator variable, extent of communication was coded into four different levels to reflect the various operational definitions of this independent variable: 1) depth/frequency, 2) breadth, 3) any talk, and 4) combination of depth and breadth. Frequency and depth of PCSC were often conflated, sometimes conceptualized as depth but operationalized as frequency, and thus were collapsed

into one category. When PCSC was operationalized in terms of breadth of topics, studies were coded as such. Studies that measured extent of PCSC in terms of breadth of conversation assessed breadth by asking participants to acknowledge whether their PCSC included a list of specific topics then calculating a breadth score. A number of studies assessed PCSC in terms of whether participants had ever engaged in “any talk” about sex-related topics; specifically, some studies assessed extent of PCSC with a single yes/no item asking if participants had ever engaged in PCSC—these studies were all coded as “any talk.” Some studies included measures of both depth and breadth but failed to report separate effects and extent of communication was coded as combination depth and breadth.

Upon examination of independent variable measures, it was noted that, in operationalizing PCSC, researchers asked participants about their experiences discussing specific topics. Operationalization of PCSC reflected four different content areas: 1) descriptive and mechanical, 2) relational, emotional, and social, 3) medical, contraception, and risk, or 4) unspecified, general talk about sex-related topics. Studies were coded as descriptive or mechanical topics when independent variable measures assessed PCSC in terms of whether or not participants’ experiences included discussion of “how sex works,” descriptions of sex, masturbation, and other types of sexual contact, as well as bodily functions associated with sex (e.g. ejaculation, lubrication, etc.), and discussions of “how to” engage in sexual contact. Studies were coded as relational, emotional, or social topics when independent variable measures assessed PCSC in terms of whether or not participants’ experiences included discussions of topics such as relational implications of sexual encounters, emotional readiness or notions of attachment and social development, the relationship between love and sexual interaction, or discussion of “waiting until the right time.” Some studies asked about specific topic areas but did

not report findings for different topic areas separately; if this was the case, studies were coded as combination content. Finally, if measurement of the PCSC independent variable was non-specific and only assessed whether or not PCSC had occurred, studies were coded as general talk about sex-related topics.

The timing of PCSC is identified in extant literature as a meaningful moderator of the relationship between PCSC and sexual risk. The overwhelming majority of studies did not specify whether the PCSC occurred prior to or after onset of adolescence, and were thus coded as unspecified timing. However, the few studies that did include this information were coded for timing of PCSC in terms of whether participants indicated the PCSC they had engaged in occurred prior to adolescence or post-adolescence.

Operationalization of sexual risk varied greatly across this body of literature; some studies assessed the relationship between PCSC and particular sexual risk-related behaviors (e.g., virgin status, or contraceptive use), some reported sexual risk in terms of communication based outcomes (e.g., condom negotiation scores), while some assessed sexual risk in terms of risk-related outcomes (i.e., STI diagnosis or experiencing an unplanned pregnancy), and still other studies reported sexual risk as a composite risk index. Studies were coded accordingly using the following categories: 1) Sexual behavior, 2) condom use/protected sex (barrier contraceptive use), 3) “other” contraceptive use (e.g., oral birth control pill), 4) communication based outcome, 5) composite safe sex or risk index, 6) STI/STD diagnosis, and 7) unplanned pregnancy.

The “sexual behavior” category included independent variables such as virgin/non-virgin status, number of sexual partners, number of sexual encounters, and behaviors generally described as risk reducing or risk increasing sexual behaviors. Condom use or barrier contraceptive use is fairly straightforward, but it should be noted that researchers assess condom

use inconsistently across this body of literature, including, but not limited to, lifetime condom use, consistent/inconsistent condom use, condom use at last sexual encounter, condom use over specific period of time. “Other” contraceptive use included measures of use of non-barrier contraceptives, including hormonal and non-hormonal birth control options (e.g., implant, oral birth control pill, IUD, etc.). Communication based outcomes include independent variables such as, condom negotiation, asking partners about STI/STD or HIV testing prior to sex, and asking partners about number of previous sexual partners prior to sex. Composite safe sex or risk index was a score calculated for participants by researchers based on a number of sexual risk indicators; these indicators included number of partners, types of contraceptives, and consistency and frequency of contraceptive use. Both the STI diagnosis and unplanned pregnancy categories reflect independent variables that assess whether or not participants have ever experienced an unplanned pregnancy or been diagnosed with an STI/STD.

The next moderator variable assessed was biological sex of the sample. Evidence suggests (Widman et al., 2016) that the effect of PCSC on sexual risk is greater for females than for males and coded separately when the format permitted. The majority of studies, however, reported mixed-sex results and were coded as mixed-sex samples. Studies were coded into one of three categories: 1) Female, for entirely female samples, 2) male, for entirely male samples, and 3) mixed sex sample, for samples that do not distinguish between male and female participants in reporting effects.

Dyadic composition reflects the individual make-up of the PCSC interaction. While many studies do not specify the make-up of the parent-child interaction, a number of studies distinguished between same-sex and cross-sex dyads. In some cases, the parent was unspecified, but the sex of the child was specified, and in other cases the parent was specified but the child

was unspecified. As such, studies were coded according to the following categories: 1) parent-child, 2) parent-daughter, 3) parent-son, 4) mother-child, 5) mother-daughter, 6) mother-son, 7) father-child, 8) father-daughter, and 9) father-son.

The final category of moderator variable concerns the racial and/or ethnic make-up of the sample of each study. While no studies reported separate effects for different ethnic groups, some studies did target particular populations, and thus it was important to code for these different groups based on available information in the case that cultural differences associated with various racial or ethnic groups have important implications for PCSC and sexual risk behaviors. As such, studies were coded according to the following categories, which were a best attempt at capturing the nuance of sampling strategies employed by researchers in this body of literature: 1) representative sample (a statistically representative sample of the population), 2) majority white/non-Hispanic sample (most often convenience samples, or samples taken in areas with little ethnic diversity), 3) purposive Black/African-American sample (purposive samples of entirely Black/African-American populations), 4) purposive Latinx/Hispanic sample (purposive samples of entirely Latinx or Hispanic individuals), 5) majority minority races/ethnicities (purposive samples of majority minority populations), and 6) purposive half Black/African-American, half white/non-Hispanic.

Statistical Methods

The present meta-analysis uses a psychometric form of meta-analysis based on a sample-weighted random effects model. The psychometric form of meta-analysis allows for correction of biasing effects of statistical artifacts, such as attenuated measurement, type II error, sampling error, and restriction in range (Schmidt & Hunter, 1977). Correcting for such errors increases the accuracy in the estimation of average relationships and has important implications for the

stability and soundness of empirically-based conclusions drawn from a particular body of literature (Ones, Viswesvaran, & Schmidt, 2016). As Preiss and Allen (1995) aptly put, “It is normal to expect that as studies accumulate on any selected domain that the findings will appear inconsistent, even contradictory” (p. 316). The body of literature concerning PCSC and adolescent sexual risk is exemplary of this rule, and thus meta-analytic review is necessary to make sense of this complex set of empirical findings.

Results

Study Selection

Initial search results yielded 917 studies matching specified search terms. An additional 129 studies were found for review by examining the reference lists of database search results. Upon close review of abstracts, 174 studies were deemed fit for inclusion. Some studies included unrecoverable data. Coding of individual studies resulted in 149 independent effect sizes (see Table 2, p. 77). All effect sizes were converted to a common metric, the correlation, and corrected for measurement attenuation.

Synthesis of Results

Hypothesis 1: The Relationship Between PCSC and Sexual Risk

H1a predicted a negative association between parent-child sexual communication and sexual risk behavior and outcomes. H1b predicted this relationship to be moderated by various characteristics of the PCSC conversation (i.e., extent, content, and timing of conversation), as well as by the way risk was assessed in each individual study (e.g., risk profile, experiencing unplanned pregnancy, and communication-based outcome). Both of these hypotheses were supported. The relationship of PCSC to sexual risk behavior and outcomes was negative, *avg. r =*

-.058, $K = 149$, $N = 107545$ (see Table 3.), based on a heterogeneous set of findings, $\chi^2(148, N = 107545) = 726.31, p < .05$.

Table 3
Variables Moderating the Relationship Between PCSC and Sexual Risk Outcomes

Variable	Avg. <i>r</i> [CI]	<i>n</i>	<i>k</i>	χ^2 (critical value)
Extent (H2)				
Frequency/depth	-.07 [-.0703, -.0697]	38751	37	267.26 (51.0)
Breadth	-.081 [-.0813, -.0807]	2540	11	3.90 (18.31) [†]
Any talk	-.059 [-.0593, -.0587]	59006	82	332.82 (103.01)
Depth & Breadth	.02 [.0197, .0203]	7248	19	122.32 (28.87)
Content (H3)				
Mechanical/descriptive	-.20 [-.2003, -.1997]	652	2	14.83 (3.84)
Contraception/risk	-.09 [-.0903, -.0897]	46952	68	390.30 (87.11)
Relational/social/emotional	-.06 [-.0603, -.0597]	6535	11	13.01 (18.31) [†]
General	-.04 [-.0403, -.0397]	15629	33	66.04 (46.19)
Multiple topics	-.03 [-.0303, -.0297]	37777	35	242.12 (48.60)
Timing (H4)				
Prior	-.0008 [-.0011, -.0005]	3613	9	72.48 (15.51)
After	-.11 [-.1103, -.1097]	545	3	2.91 (5.99)
Unspecified	-.06 [-.0603, -.0597]	103387	137	650.92 (164.22)
Operationalization DV (H5)				
Sexual behavior	-.03 [-.0303, -.0297]	52344	63	298.25 (81.38)
Barrier contraceptive use	-.08 [-.0803, -.0797]	32320	28	251.09 (40.11)
Other contraceptive use	-.06 [-.0603, -.0597]	8828	32	31.19 (44.99) [†]
Communication based	-.16 [-.1603, -.1597]	1116	8	18.10 (14.07)
Composite Risk	-.18 [-.1803, -.1797]	5601	11	92.87 (18.31)
STI diagnosis	-.03 [-.0303, -.0297]	6358	4	16.49 (7.82)
Unplanned pregnancy	-.19 [-.1903, -.1897]	978	3	18.32 (5.99)
Sex (H6)				
Female	-.08 [-.0803, -.0797]	21695	58	230.44 (75.62)
Male	-.06 [-.0603, -.0597]	16714	28	126.34 (40.11)
Mixed sex sample	-.05 [-.050, -.0497]	69136	63	369.52 (81.38)
Dyadic comp. (H7)				
Parent-child	-.06 [-.0603, -.0597]	50333	49	330.79 (65.17)
Parent-daughter	-.06 [-.0603, -.0597]	15037	31	140.55 (43.77)
Parent-son	-.04 [-.0403, -.0397]	13317	18	62.94 (27.59)
Mother-child	-.05 [-.0503, -.04967]	18969	17	52.73 (26.30)
Mother-daughter	-.11 [-.1103, -.1097]	3405	13	52.14 (21.03)
Mother-son	-.09 [-.0903, -.0897]	2095	7	22.91 (12.59)
Father-child	-.06 [-.0603, -.0597]	1437	8	12.82 (14.07) [†]
Father-daughter	-.07 [-.0703, -.0697]	1650	3	10.93 (5.99)
Father-son	-.16 [-.1603, -.1597]	1302	3	40.49 (5.99)
Ethnicity (H8)				
Representative sample	-.06 [-.0603, -.0597]	74986	68	531.49 (87.11)
Majority White/non-Hispanic	-.04 [-.0403, -.0397]	2686	14	23.21 (22.36)
Purposive Black/A-A	-.05 [-.0503, -.0497]	25424	44	108.91 (59.30)
Purposive Hispanic	-.08 [-.0803, -.1497]	1572	4	4.13 (7.82) [†]
Purposive minority	-.15 [-.1503, -.1497]	1734	12	28.08 (19.68)
Purposive White/Black	-.21 [-.2103, -.2097]	1143	7	30.49 (12.59)
Total (H1)	-.058	107545	149	726.31 (177.39)

*All effect sizes significant at $\leq .05$.

[†] indicates homogeneous sample

Hypothesis 2: Extent of Parent-Child Sexual Communication

The extent of communication characterizing PCSC conversations was identified as an important moderator variable due to the inconsistency with which the independent variable PCSC is operationalized across studies. In coding individual studies, extent of communication in terms of “depth” of conversation was often conflated with “frequency” of conversation, such that authors would conceptualize this variable in terms of “depth” but operationalize this variable in terms of “frequency” of conversations. As such, studies reporting frequency or depth of communication as a characterization of extent of communication were collapsed into one level of this moderator variable. Other individual studies characterized extent of PCSC in terms of breadth of topics covered during conversation, while some reported a combination of depth and breadth of conversation, and others still measured PCSC by asking whether or not any PCSC had ever occurred.

Ultimately, the “Extent of Communication” was coded as a moderator variable with four levels to reflect the different methods of operationalization of this independent variable: 1) frequency/depth, 2) breadth, 3) any talk, and 4) combination of depth and breadth. H2 predicted that the extent of sexual communication occurring between parents and children would moderate the relationship between PCSC and sexual risk, such that (a) more in-depth, (b) frequent, and (c) PCSC covering greater breadth of topics would strengthen the observed relationship between PCSC and sexual risk. This hypothesis was partially supported. Moderator analyses showed the relationship of frequency/depth of PCSC to sexual risk was negative, *avg. r = -.07, k = 37, n = 38751*, indicating that more in-depth or frequent PCSC is associated with less sexual risk-taking behavior and sexual risk outcomes.

The relationship between breadth of PCSC and sexual risk was negative, $avg. r = -.081, k = 11, n = 2540$, such that, PCSC which includes a greater number of topics is associated with lower levels of sexual risk. Having engaged in any PCSC at all, or “any talk,” was negatively related to sexual risk as well, with $avg. r = -.059, k = 82, n = 59006$. Interestingly, studies reporting the level of PCSC as a combination of depth and breadth of conversation show a very small, but positive relationship between PCSC and sexual risk, with $avg. r = .02, k = 19, n = 7248$. Individual study characteristics likely contributed to this observed relationship (see Discussion for detailed explanation).

Providing additional support for H2, a one-way analysis of variance (ANOVA) of the “Extent of Communication” shows a significant difference between these different operationalizations of PCSC, $F(3,107540) = 2838.33, p < .05, MSE = .006$. Pairwise comparison of the means using Fisher’s Least Significant Difference (LSD) test shows a significant difference between the mean effect of each level of the “Extent of Communication” moderator variable.

Hypothesis 3: Content of Parent-Child Sexual Communication

The content of PCSC is another important difference in the way this independent variable is operationalized across studies. Content of communication was assessed as a moderator variable, as the content addressed in any given PCSC conversation could have a distinct impact on associated sexual risk outcomes (Lefkowitz & Stoppa, 2006; Warren & Warren, 2015). In coding of individual studies five distinct categories were identified, representing the various ways content of PCSC is measured: 1) descriptive/mechanical, 2) relational/emotional/social, 3) medical/contraception/risk, 4) general talk about sex-related topics, and 5) PCSC reported as spanning multiple content categories.

H3 predicted the content of PCSC would moderate the relationships between PCSC and sexual risk, such that the relationship between content of PCSC and sexual risk would be strongest when PCSC covered information related to contraception and risk; followed by PCSC regarding descriptive or mechanical topics; relational, emotional, and social topics; and finally, the strength of this relationship was predicted to be lowest when PCSC was characterized as a general sex talk. This hypothesis was partially supported. Moderator analyses showed the relationship between PCSC addressing descriptive/mechanical topics and sexual risk was strongest, $avg. r = -.20, k = 2, n = 652$; followed by medical/contraception/risk messages, $avg. r = -.09, k = 68, n = 46952$; relational/emotional/social messages, $avg. r = -.06, k = 11, n = 6535$; general sex-related talk, $avg. r = -.04, k = 33, n = 15629$; and finally, conversations which contained messages of multiple categories, $avg. r = -.03, k = 35, n = 37777$.

Results of a one-way ANOVA of the “Content of Communication” provide additional support for H3, demonstrating a significant difference between categories of PCSC content, $F(4,107540) = 3998.33, p < .05, MSE = .006$. Pairwise comparison of the means using Fisher’s LSD test shows a significant difference between the mean effect of each level of the “Content of Communication” moderator variable.

Hypothesis 4: Timing of PCSC

Whether PCSC occurred prior to or after onset of sexual activity is also identified in extant literature as an important factor in determining the efficacy of such conversations. Specifically, past research (e.g., Karofsky, Zeng, Kosorok, 2001) shows that children whose parents engaged in PCSC prior to onset of sexual activity were less likely to engage in risky sexual behavior, and more likely to postpone sexual activity altogether. H4 predicted timing of PCSC would moderate the relationship between PCSC and sexual risk, such that PCSC occurring

prior to onset of sexual activity would strengthen the negative relationship between PCSC and sexual risk.

This hypothesis was not supported, but individual study characteristics and sampling likely account for this observed effect. For studies reporting the effect between PCSC occurring prior to onset of sexual activity, $avg. r = -.0008, k = 9, n = 3613$; for studies reporting the effect of PCSC occurring post-onset of sexual activity, $avg. r = -.11, k = 3, n = 545$. The overwhelming majority of studies did not specify whether reported PCSC occurred prior to or post-onset of sexual activity, $avg. r = -.06, k = 137, n = 103387$. Results of a one-way ANOVA of the “Timing of Communication” variable indicate a significant difference between groups, $F(2, 107540) = 982.14, p < .05, MSE = .007$. Pairwise comparison of the means using Fisher’s LSD test shows a significant difference between the mean effect of each level of the “Timing of Communication” moderator variable.

Hypothesis 5: Operationalization of Sexual Risk

There is considerable inconsistency in how sexual risk is operationalized across studies. Yet, this body of literature treats all observable effects between PCSC and “sexual risk” as one in the same, particularly when discussing implications of the supposed inconsistency in observed effects. Additionally, PCSC may be more effective in mitigating particular risk factors over others. H5 addressed whether or not this inconsistent characterization of sexual risk is problematic in terms of how results across studies can be meaningfully synthesized. H5 predicted that the operationalization of sexual risk would have a moderating effect on the relationship between PCSC and sexual risk. This hypothesis was supported. The strength of the association between PCSC sexual risk was strongest when assessing unplanned pregnancy as an outcome variable; PCSC was negatively associated with experiencing an unplanned pregnancy, $avg. r = -$

.19, $k = 3$, $n = 978$. This was followed by studies assessing risk using a composite safe sex/risk index, $avg. r = -.18$, $k = 11$, $n = 5601$. Next, studies assessing sexual risk using a communication-based outcome (e.g., condom negotiation), showing that children who engaged in lower levels of PCSC were less likely to engage in communication-based risk-prevention strategies, $avg. r = -.16$, $k = 8$, $n = 1116$.

The remainder of outcome variables were more weakly associated with PCSC. Children who engaged in lower levels of PCSC were less likely to use condoms/barrier contraceptives, $avg. r = -.08$, $k = 28$, $n = 32320$, and less likely to use other types of contraceptives (e.g., oral birth control pills or unspecified form of contraceptive), $avg. r = -.06$, $k = 32$, $n = 8828$, than their counterparts who had engaged in higher levels of PCSC. Children who experienced higher levels of PCSC were less likely to have engaged in a specified sexual behavior at the time they were surveyed, or more likely to maintain virgin status longer, $avg. r = -.03$, $k = 63$, $n = 52344$. Children who engaged in higher levels of PCSC were less likely to have experienced an STI/STD, $avg. r = -.03$, $k = 4$, $n = 6358$. Results of a one-way ANOVA provide further support of H5, $F(6,107540) = 5077.4$, $p < .05$, $MSE = .005$. Pairwise comparison of the means using Fisher's LSD text shows a significant difference between the mean effect of each level of the "Operationalization of Sexual Risk" moderator variable.

Hypothesis 6: Biological Sex of Child

Previous research (e.g., Widman et al., 2016) identifies biological sex of the child as an important factor to consider when examining the effects of PCSC on sexual risk behavior. The relationship between PCSC and sexual risk seems to be stronger for girls than for boys, and was therefore examined as a moderator variable. H6 predicted that biological sex of the child/adolescent would moderate the relationship between PCSC and sexual risk, and that the

negative relationship between PCSC and sexual risk would be stronger for girls than for boys who engaged in PCSC. This hypothesis was supported, though the moderating effect was not as strong as expected. This is likely due to the diversity of operationalization methods for both independent and outcome variables in studies included in this analysis. For girls, $avg. r = -.08, k = 58, n = 21695$, for boys, $avg. r = -.06, k = 28, n = 16714$, and for mixed-sex samples that did not report separate effects for boys and girls, $avg. r = -.052, k = 63, n = 69136$. Results of a one-way ANOVA provide further support of H6, $F(2,107540) = 930.67, p < .05, MSE = .006$. Pairwise comparison of the means using Fisher's LSD test shows a significant difference between the mean effect of each level of the "Biological Sex of Child" moderator variable.

Hypothesis 7: Dyadic Composition

H7 predicted that dyadic composition would moderate the negative relationship between PCSC and sexual risk, such that the association between same-sex PCSC dyads and sexual risk would be stronger than effects reported of PCSC dyads with an unspecified dyadic composition, and stronger than cross-sex dyads. This hypothesis was supported: father-son dyads, $avg. r = -.16, k = 3, n = 1302$; mother-daughter dyads, $avg. r = -.11, k = 13, n = 3405$; mother-son dyads, $avg. r = -.09, k = 7, n = 2095$; father-daughter dyads, $avg. r = -.07, k = 3, n = 1650$; unspecified parent-daughter, $avg. r = -.063, k = 31, n = 15037$; father-unspecified child, $avg. r = -.062, k = 8, n = 1437$; unspecified parent-unspecified child, $avg. r = -.06, k = 49, n = 50333$; mother-unspecified child, $avg. r = -.05, k = 17, n = 18969$; unspecified parent-son, $avg. r = -.04, k = 18, n = 13317$. Results of a one-way ANOVA provide further support of H7, $F(8,107540) = 526.43, p < .05, MSE = .007$. Pairwise comparison of the means using Fisher's LSD test shows a significant difference between the mean effect of each level of the "Dyadic Composition" moderator variable.

Hypothesis 8: Racial/Ethnic Makeup of Sample

Important sociocultural and economic factors, namely cultural-level group differences in attitudes and norms regarding sexual activity, are a driving force in observed racial/ethnic differences in behaviors often characterized as sexually risky. Previous research (Ahrold & Meston, 2010; Upchurch, Levy-Storms, Sucoff, & Aneshensel, 1998) supports the notion that differences in sexual behavioral norms might manifest as observable racial/ethnic differences in the effects of PCSC on sexual risk. H8 predicted that the Racial/Ethnic makeup of study sample would moderate the negative relationship between PCSC and sexual risk. This hypothesis was supported. Studies reporting effects observed in a purposive sample of half Black/African American and half White/Caucasian, *avg. r* = -.21, *k* = 7, *n* = 1143; for studies reporting effects observed in a purposive sample comprised primarily of minority races/ethnicities, *avg. r* = -.15, *k* = 12, *n* = 1734; for studies reporting effects observed in a purposive Hispanic sample, *avg. r* = -.08, *k* = 4, *n* = 1572; for studies reporting effects in a representative sample, *avg. r* = -.06, *k* = 68, *n* = 74986; for studies reporting effects observed in a purposive sample comprised of Black or African American participants, *avg. r* = -.05, *k* = 44, *n* = 25424; and for studies reporting effects in a sample comprised primarily of White/Caucasian participants, *avg. r* = .04, *k* = 14, *n* = 2686. Results of a one-way ANOVA provide further support of H8, $F(5,107540) = 1554.5, p < .05, MSE = .006$. Pairwise comparison of the means using Fisher's LSD test shows a significant difference between the mean effect of each level of the "Racial/Ethnic Makeup of Sample" moderator variable.

Discussion

Summary of Evidence

The data synthesized in this meta-analysis include one hundred forty-nine independent effect sizes, reflecting over one hundred thousand adolescent experiences with parent-child sexual communication. This meta-analysis documented a significant negative association between PCSC and sexual risk. Individuals who reported higher levels of PCSC as children and adolescents were less likely to engage in sexually risky behavior, and more likely to engage in preventative measures as adolescents and emerging adults. The strength of the association between PCSC and sexual risk was moderated by the extent of PCSC, the content covered during PCSC conversations, the timing of PCSC relative to onset of sexual activity, the operationalization of sexual risk, the biological sex of the child, the dyadic composition of the PCSC conversational partners, and the racial/ethnic makeup of the sample.

After several decades of research on the effects of parent-child sexual communication on sexual risk behaviors in emerging adulthood, researchers are still asking the same question: Does parent-child sexual communication matter? Parent-child sexual communication does act as a protective factor in mitigating various contributors to sexual risk in adolescence. However, inconsistent findings and underwhelming observed effect sizes draw attention to methodological inconsistencies and inaccuracies plaguing this body of literature. Namely, the operationalization of the parent-child sexual communication process varies greatly from study to study. Few studies actually manage to capture the complexity and nuance of the parent-child sexual communication message, seldom acknowledging that these conversations are emergent in nature and evolve over time, undermining the significance of communication itself. This meta-analysis also provides a

prescriptive framework for how, when, and what to discuss with children and adolescents regarding sexual topics.

Extent of Parent-Child Sexual Communication

The relationship between PCSC and sexual risk was significantly stronger when the extent of communication was operationalized in terms of breadth of communication. In other words, the greater number of topics covered during PCSC episodes, the more PCSC functions as a protective factor. Children of parents covering a greater number of topics related to sexuality and sexual risk, demonstrate reduced levels of sexually risky behavior during emerging adulthood. Additionally, the relationship between PCSC and sexual risk becomes significantly stronger when the extent of communication was operationalized as frequency or depth of conversations. As mentioned previously, many studies conflated the frequency of PCSC with the extent of PCSC. Rather than distinguish between conversations characterized as in-depth and the occurrence of multiple conversations over the course of time, a number of individual studies measured depth of conversation by having participants indicate the number of conversations that occurred or the relative frequency of conversations. Because of the inability to distinguish between the two, the two categories were collapsed into one.

The overwhelming majority of studies ($k = 82$) included in this meta-analysis operationalized PCSC with a single item asking respondents whether or not they had ever had a conversation with one of their parents about sex. For these studies, the association between PCSC and sexual risk (*avg. $r = .06$*) was equivalent to the grand mean ($M = .06$). The last category of extent of communication includes studies which measured extent by assessing both depth and breadth of PCSC. Interestingly, for studies that measured extent of PCSC in terms of both depth and breadth showed a very small, positive association with sexual risk (*avg. $r = .02$*).

In other words, these children who engaged in PCSC were slightly more likely or no less likely to engage in sexually risky behavior than those who had not engaged in PCSC. Upon close examination of the individual effect sizes included in this average, however, it is apparent that the majority of these effect sizes come from samples of explicitly vulnerable, at-risk populations.

A number of other individual study characteristics for this group of studies likely also contributed to this observed effect. Aronowitz et al. (2005) report the effects for an entirely urban sample of young women in New York City, over half of whom come from definitively impoverished households. Kupungu and colleagues (2010) sampled young women entirely from urban, impoverished neighborhoods in Chicago, all of which had a high occurrence of documented HIV rates. Donenberg, Emerson, and Mackesy-Amiti (2011) also sampled an entirely urban population in Chicago, and all participants were receiving outpatient psychiatric treatment at the time they were surveyed, demonstrating their vulnerability as an at-risk group. Haley and colleagues surveyed rural high school students, another demonstrably at-risk population (Haley, Puskar, Terhorst, Terry, & Charron-Prochownik, 2012). This particular study reported effect sizes of PCSC in unspecified parent-child dyads; the present meta-analysis provides evidence that dyadic composition is an important moderator variable, and reporting effects of unspecified dyads obfuscates actual effects. This is discussed in detail in a later section concerning dyadic composition as a moderator variable.

The findings demonstrating extent of PCSC as an important moderator variable have undeniable implications for this body of literature as a whole, particularly for the consistent failure to capture the complexity of PCSC messages. Inconsistency in operationalization of the PCSC variable is problematic in and of itself, and has undoubtedly contributed to inconsistent findings across this body of literature. The one consistency is that the majority of studies

comprising this body of literature operationalize PCSC in a way that oversimplifies the potential variance in message structure, and fails to capture any of the important nuance of the PCSC context.

Content of Parent-Child Sexual Communication

The content discussed during any given PCSC episode can vary greatly, and each topic can have a distinct influence on beliefs, values, attitudes, and knowledge regarding sexual behavior. For example, repeated messages simply promoting abstinence until marriage are quite different than conversations exploring various methods of contraception and STI prevention, best practices in maintaining sexual health, and sexual pleasure. Additionally, there is evidence that establishing a pattern of PCSC throughout childhood and adolescence, and treating these conversations as ongoing and developing creates more of an impression on adolescents (Flores & Barroso, 2017). Regular conversations about specific topics are more easily recalled by adolescents than are lengthy, one-off, “Birds and the Bees” talks about sex. Parents often fear the perception of permissiveness, and that discussing sex with young adolescents could lead to earlier debut of sexual activity. This fear is demonstrably unfounded, however, and there exists considerable evidence that children whose parents fully engage them in regular conversation wherein both sexual risk and prevention, as well as positive aspects of sexual relationships are reciprocally discussed are more likely to postpone sexual activity, and to engage in safer sex practices when they do begin having sexual relations (Flores & Barroso, 2017). Adolescents report that these all-encompassing conversations during which question asking is encouraged are more comfortable and had a bigger impact on their sexual decision-making than teens whose parents were avoidant and expressed intolerant or restrictive views on sexual activity (Guzman, Golub, Caal, Hickman, & Ramos, 2013).

Unfortunately, all-encompassing, regularly occurring conversations do not characterize typical PCSC experiences. Parents often wait for developmental cues to indicate it is time to start having PCSC conversations, or wait for their children to approach them with specific questions (Flores & Barroso, 2017). However, adolescents tend to wait on their parents to take the lead in initiating PCSC. When children and younger adolescents do ask questions, parents are likely to shut down those conversations and discourage question-asking for fear of introducing their children to information they are not developmentally ready to hear or understand (Ashcraft & Murray, 2017). Parents also fear not have adequate knowledge to address their children's questions, telling their children incorrect information, revealing too much personal information, sounding stupid, having to answer difficult questions, or finding something out about their child they did not want to (e.g., prior sexual activity) (Ashcraft & Murray, 2017). All of these concerns lead to feelings of fear, shame, and embarrassment, contributing to future reluctance of children to ask questions, and effectively impeding meaningful PCSC conversations from taking place (Ashcraft & Murray, 2017).

Parents' tendencies regarding sexual communication with their children favor general discussion rather than specific topics that are personalized for the child. Parents tend to focus on warnings about the consequences of sex, but refrain from providing descriptive, factual information regarding what intercourse is like or describing how to use specific methods of contraception. In other words, when parents do engage in PCSC they will talk to their children about the importance of avoiding STIs and HIV, and preventing pregnancy, as well as the dangers of having sex. However, they rarely accompany those messages regarding risk and contraception with actual directives for how to avoid risk, properly use contraception, or even explain to their children how intercourse and other sexual activities work. Parents also

infrequently discuss the relational, social, and emotional aspects of sexual relationships, which are, for most people integral components of their sexual experiences. Parents also refrain from discussing sexual pleasure, or any topics regarding sex positivity with their children (Aronowitz, Todd, Agbeshie, & Rennells, 2007; Ashcraft & Murray, 2017).

Cautionary conversations are rendered far less effective in preventing sexual risk behaviors than they could be because they provide children and adolescents with little direction on how to actually employ sexual risk reduction behaviors. Without addressing self-efficacy of children in reducing their own sexual risk, they are left with the belief that risk is an inevitability of sexual interaction. Children's only recourse for reducing the resulting cognitive dissonance is to either conclude they are not at risk, or that they have no power to reduce their risk (Strecher, McEvoy, Becker, & Rosenstock, 1986). Results of the present meta-analysis support the notion that parents' conversations about sex with their children and adolescents should go beyond imparting fear of sexual risk. In fact, when adolescents reported that their parents discussed descriptive or mechanical aspects of sex with them (i.e., what sexual intercourse and other sex acts are, how to properly use various methods of contraception, and what to expect during a sexual interaction), the negative relationship between PCSC and sexual risk approaches a moderate sized effect (*avg. r = -.20*).

Results also support the assertion that PCSC conversations regarding specific sexual risk and contraception information (*avg. r = -.09*), as well as conversations specifically addressing the relational, emotional, and social aspects of sexual interactions (*avg. r = -.06*) are more memorable and make a bigger impact on sexual decision making in emerging adulthood than do conversations characterized as a general sex-talk (*avg. r = -.03*). This echoes recommendations of previous research (e.g., Ashcraft & Murray, 2017; Flores & Barroso, 2017) that PCSC are

most effective in making a lasting impression upon children's sexual risk-taking behaviors in emerging adulthood. The question remains, however, whether specific topic-based PCSC conversations have a multiplicative or additive effect. The results of the present meta-analysis allow for comparison of the impact of the discussion of individual topics on sexual risk, but do not allow for assessment of multiple topic-specific conversations. This should be a focus of future research, and should inform development of PCSC intervention and parent-child focused sexual education programs.

Timing of Parent-Child Sexual Communication

Extant literature identifies timing of PCSC conversations to have a significant impact on PCSC efficacy as a protective factor. Specifically, earlier conversations establish the level of comfort and patterns of interaction necessary for children to feel welcome to approach their parents with questions later in adolescence. The Social Development Model provides support for the notion that, for PCSC to have maximum impact it must begin at an earlier age, prior to sexual debut, and ideally be sustained throughout adolescence.

At first glance, the present meta-analysis does not support this assertion, but upon close examination of the current data set multiple factors emerge as possibly accounting for this discrepancy. Very few of the effect sizes sampled for this meta-analysis reported data on timing of PCSC relative to sexual risk outcomes ($k = 9, n = 3613$). The overwhelming majority of effect sizes included did not include data on whether or not the PCSC reported on occurred prior to or after onset of sexual activity ($k = 137, n = 103387$). For those studies that did report data for children who engaged in PCSC prior to onset of sexual activity, individual study characteristics account for lower than expected effect sizes.

For example, Atienzo, Walker, Campero, Lamadrid-Figueroa, and Gutierrez (2009) sampled public high school students in Morelos, Mexico about sexual behavior and use of unspecified contraceptives. This was a comprehensive study, assessing frequency of PCSC on multiple sex-related topics, including biological changes associated with adolescence, condom use, peer pressure, unplanned pregnancy, abortion, and HIV and STI risk. However, this was an uncharacteristically at-risk sample. The effect sizes reported reflect experiences of adolescents who were sexually active at age fourteen or younger, and those who postponed first intercourse until at least fifteen years of age. Atienzo and colleagues (2009) show that, adolescents who engaged in PCSC prior to onset of sexual activity were more likely to postpone first intercourse past age fifteen. However, the second effect size they reported reflected condom use of sexually active adolescents, the mean age of whom was 14.4 for males and 15 for females. For sexually active adolescents the relationship between PCSC and condom use was $r = -.03$, such that children who had engaged in PCSC prior to onset of sexual activity were barely less likely than those who had engaged in PCSC after onset of sexual activity. Based on these sample characteristics one can conclude that this sample is an at-risk population.

Bersamin and colleagues (2008) report the relationship between PCSC and onset of sexual intercourse, but their measure of PCSC focused primarily on messages of disapproval from parents (e.g., “Have your parents ever told you not to have sex until you are married.”). As has already been established, when PCSC messages lack any sense of sex positivity, this instills a sense of fear and embarrassment, and establishes for the child that open conversation about sexual topics is off-limits. Such messages might influence an adolescent to briefly postpone sexual activity, but do little to inform adolescents as to how to reduce risk of exposure once they do become sexually active. Hutchinson (2002) reported results from a primarily urban

population, a demonstrably at-risk population. Miller, Levin, Whitaker, and Xu (1998) reported results of an entirely sexually active adolescent sample based in New York, Alabama, and Puerto Rico, all between the ages of fourteen and seventeen. This study assessed the relationship between maternal discussions of condom use, specifically, as it relates to regular and lifetime condom use. While regular, lifetime condom use is an important indicator of sexual risk, it is not the only one, and does not account for other factors which result in risk reduction, such as the potential use of other forms of contraception, or serial monogamy in choosing sexual partners. Specifically, Miller and colleagues (1998) show that early maternal conversations about condoms had a direct impact on condom use at first intercourse, and an indirect effect on lifetime, regular condom use, mediated by condom use at first sex.

All of this taken together suggests that timing of PCSC does matter, and that engaging in PCSC prior to onset of sexual activity absolutely does influence sexual risk. However, there are not many studies that actually assess the impact of timing on the relationship between PCSC and sexual risk. The impact of timing is likely more pronounced depending upon other contextual factors, including content of message, extent of communication, and the particular risk outcome of interest. Additionally, in the present meta-analysis it appears there are some individual study characteristics that have obfuscated observable effects. Timing of PCSC remains an important moderator variable, and should be a focus of future research. Realistically, earlier PCSC leaves room for more frequent, regular, detailed conversations regarding sexual risks and sexuality, all demonstrated to be important factors in promoting effective PCSC interactions.

Operationalization of Sexual Risk

The existing body of literature regarding adolescent sexual risk tends to treat all indicators of sexual risk as equal contributors to an overall understanding of risk, but sexual risk

indicators (i.e., behaviors and outcomes, such as unplanned pregnancy and STI/HIV diagnosis) are not all equally representative of an individual's sexual risk profile. PCSC effects different types of sexual risk behaviors distinctly. Results of the present meta-analysis support the notion that PCSC is especially influential in promoting some safe sex behaviors and not others, and better apt to curb some risky behaviors over others. One lesson researchers have repeatedly learned is that most adolescents are going to have sex. For the average adolescent, sexual debut takes place around 16.5 years of age (Vasilenko et al., 2016). Not surprisingly, PCSC is very weakly associated with sexual behavior (*avg. r = -.03*). In other words, adolescents who engage in PCSC are almost no less likely than adolescents who have not engaged in PCSC to have engaged in sexual activity.

On the other hand, PCSC is negatively associated with experiencing an unplanned pregnancy (*avg. r = -.19*), such that adolescents/emerging adults who have engaged in PCSC are moderately less likely than those who have not engaged in PCSC to have experienced an unplanned pregnancy. Adolescents who have engaged in PCSC are also moderately more likely than those who have not to engage in communication-based safer sex behaviors (e.g., engaging in condom negotiation with sexual partners, asking potential sexual partners about STI/HIV testing, saying “no” when experiencing peer pressure) (*avg. r = -.16*). This association is noteworthy because partner sexual communication has been demonstrated to directly influence safer sex behaviors like condom use and number of lifetime sexual partners, demonstrating that PCSC both directly and indirectly influences sexual risk behaviors.

PCSC is also moderately associated with composite sexual risk scores (*avg. r = -.18*), indicating that PCSC reduces the overall risk profile. Individuals who engage in PCSC are also more likely to report using condoms (*avg. r = -.08*) or other forms of contraceptives (*avg. r = -*

.06) than individuals who have not engaged in PCSC. Interestingly, there was a very small negative association between PCSC and STI diagnosis (*avg. r = -.03*), indicating that PCSC does not a strong impact on that particular outcome. However, there were very few studies included in this meta-analysis that examined STI diagnosis as an outcome variable ($k = 4$), and most of these studies examined this effect in at-risk populations. For example, Khurana and Cooksey (2012) reported this effect for adolescents whose first intercourse occurred prior to age 15. Hutchinson (2002) reported this effect for a distinctly urban population.

This particular set of results highlights some important features of this body of literature and provides researchers with important insight regarding directions for future research and study design. The discrepancy between the observed effects for different sexual risk outcomes shows that PCSC does not influence all sexual risk behaviors equally. Of particular interest is the difference in effect sizes between STI diagnosis and unplanned pregnancy. While it is important to highlight sampling characteristics that might have contributed to such a sizeable discrepancy, this is nonetheless a noteworthy. This result suggests that PCSC concerning sexual risk is far more potent in positioning early, unplanned pregnancy as a salient risk factor than it is for STIs and HIV. This is a problem that needs solving; people ages 15-24 account for over half of new STI diagnoses (sexually transmitted infection; e.g., chlamydia, gonorrhea, syphilis, and trichomoniasis) (CDC, 2014b), and despite a majority of 15-24 year olds responding with no concern about becoming infected with HIV, youth ages 13-24 accounted for 21% of new HIV diagnoses in the U.S. in 2011 (CDC, 2013). This rate remains steady, with 21% of all new HIV diagnoses occurring in those ages 13-24 as of 2017 (CDC, 2018). The apparent ineffectiveness of PCSC at curbing STI and HIV rates in emerging adulthood draws attention to the aforementioned result showing that PCSC messages containing specific information and

instruction regarding risk prevention and contraceptive methods is more strongly associated with a reduction in sexual risk than are general conversations about STIs and HIV. It is worth mentioning again that specific instruction regarding sex and contraceptive methods is a topic broached with relative infrequency (Ashcraft & Murray, 2017).

One question left unanswered is whether particular PCSC associates with particular risk factors distinctly. Using composite sexual risk scores to assess adolescent sexual risk allows for research to, “better capture the influence of core contextual, interpersonal, and intrapersonal dynamics that affect multiple sexual risk behaviors,” (Barker, Scott-Sheldon, Stone, & Brown, 2019, p. 2305). However, measuring and reporting particular sexual risk factors should also persist as common practice. There exists considerable variability in adolescent sexual behavior in general, including in regard to particular risk factors such as frequency of sexual activity and specific sex acts. For example, there is a demonstrably low correlation between number of sexual partners and frequency of engaging in sexual activity without a condom (Barker et al., 2019). Only reporting composite scores obfuscates the nuance of sexual risk in adolescents and emerging adults, and undermines the complexity of PCSC messages and specific effects of PCSC on various elements of sexual risk. This would leave intervention and education development shortsighted in designing effective parent-focused education initiatives, and would certainly limit experts’ ability to provide message-specific advice to parents.

Biological Sex of Child/Adolescent

There exists a documented bias in both the type of messages girls and boys generally receive from parents regarding sexual risk and sexuality, as well as the effect of that PCSC on sexual risk behaviors. Specifically, adolescent boys tend to receive fewer messages regarding negative repercussions associated with risky sexual behavior, and more messages directing them

to use barrier contraception than do adolescent girls (Flores & Barroso, 2017; Widman et al., 2016). One existing meta-analysis (Widman et al., 2016) reported a much stronger association between PCSC and safer sexual behavior for girls (*avg. r = .12*) than for boys (*avg. r = .04*). In general, parents refrain from discussing sex-positive topics such as sexual desire and pleasure with their adolescents; they also rarely discuss specific types of sexual practices (Evans, Widman, Kamke, & Stewart, 2020).

A recent qualitative review (Flores & Barroso, 2017) highlights the differences in content of PCSC received by boys compared to that received by girls, and provides evidence that such messages reinforce gender stereotypes. The emphasis for messages to boys acknowledges the inevitability of their sexual debut, and the importance of using condoms. The emphasis for girls is to wait as long as possible to have sex, and to avoid getting pregnant. The present meta-analysis found a significant difference in the association between PCSC and sexual risk for boys (*avg. r = -.06*) and girls (*avg. r = -.08*), but this difference was not as great in magnitude as expected and smaller than observed in Widman and colleagues 2016 meta-analysis. The clue as to why likely lies in the interaction effect of gender dynamics (Flores & Barroso, 2017).

Dyadic Composition

Dyadic composition reflects both the relational roles filled and biological sex of parent and child during the PCSC interaction. Widman and colleagues' (2016) provided evidence that PCSC is more effective in promoting safe sex behaviors when it involves a child's mother, in comparison with conversations involving fathers. H7 tested this assumption and sought to determine whether effectiveness of PCSC might also be improved if same-sex conversations about PCSC take place. Because information related to sexuality and safe sex behaviors often contains biological sex-specific information, these messages might resonate more with children

and adolescents if they perceive the source of that information to share a similar perspective to their own. Additionally, many studies do not report dyad-specific effects, and the current study sought to promote more sound research practices by identifying study characteristics that may lead to obfuscation of meaningful effects.

The difference in magnitude of effect size for unspecified parent-child dyads (*avg. r = -.06*) and sex-specific parent-child dyads draws attention to the importance of gender dynamics in the parent-child relationship. Mothers are most commonly the parent engaging in PCSC, and daughters report receiving the majority of sexual health information from their mothers (Flores & Barroso, 2017; Kapungu et al., 2010). Boys, on the other hand, sometimes report receiving the majority of their sexual health information from their fathers (Tobey, Hillman, Anagurthi, & Somers, 2011), but other boys report this is not the case, having received an equal or majority of sexual information from mothers (Rafaelli, Bogenschneider, & Flood, 1998). The results of this meta-analysis show that parent-child sexual communication is far more effective as a protective factor in promoting safer sexual behavior when it occurs in same-sex dyads. In fact, dyadic composition emerged as one of the most significant moderator variables, with the association between PCSC occurring in father-son dyads (*avg. r = -.16*) and in mother-daughter dyads (*avg. r = -.11*), and sexual risk far exceeding the average observed effect across all studies. As results of this meta-analysis indicate, and supported in Flores and Barroso's (2017) qualitative review, discussing specific topics rather than general sex-related topics during PCSC conversations increases PCSC efficacy as a protective factor in promoting safer sex behavior. Much of the information related to sexual health, sexual development, and even sexual pleasure is biological sex-specific, and it is likely that same-sex PCSC dyads facilitate discussion of personalized, specific topics during such interactions. Cross-sex dyads also demonstrated a stronger than

average association with sexual risk (mother-son *avg. r* = -.09; father-daughter *avg. r* = -.07), highlighting the idea that if the conversation is involved enough to be memorable, both mothers and fathers play an important role in sex education for both daughters and sons.

Racial/Ethnic Makeup of Sample

Results of the present meta-analysis indicate race/ethnic background is an important moderator variable in the association between PCSC and sexual risk. It should be noted that, race and ethnicity are used as a proximal indicator of cultural background in the absence of consistent measurement of cultural background and identity. Yet, ethnicity, often conflated with racial categorization, is still an important social construct with implications for how individuals interact with the world around them (Ford & Harawa, 2010). An ethnicity is a social group with a, “shared racial, linguistic, or national identity” (Jary & Jary, 2001, p. 151). While often associated with racial or ethnic categories, these categorizations are by no means synonymous with cultural background. Rather, ethnicity is a multidimensional, “social construct that is tied to race and used both to distinguish diverse populations and to establish personal or group identity” (Ford & Harawa, 2010, p. 253). Nonetheless, in the absence of consistent and appropriate measurement of various dimensions of culture which directly influence norms, attitudes, beliefs, and behaviors related to sexual activity, the race/ethnicity category allows for approximation of meaningful effects of cultural group membership on sexual risk and associated health disparities (Ford & Harawa, 2010). The observed difference in magnitude of effect size (e.g., purposive sample of half Black/African American and half White/Caucasian *avg. r* = -.21, representative sample *avg. r* = -.06) suggests a strong cultural influence on the effects of PCSC on sexual risk behavior. This difference is likely attributable to specific, cultural group-level attitudes and norms regarding

contraception and sexual behavior, and how those attitudes and norms are communicated during PCSC interactions.

Theoretical and Methodological Implications

As a subfield, those researching sexual risk need to be consistent in how they define overall sexual risk, and careful in assigning weight to particular sexual behaviors or indicators of risk. General sexual behavior is not a reliable indicator of overall sexual risk due to a number of reasons, including inconsistencies in how individuals define sex, and the risk (i.e., health beliefs) they assign to specific sexual behaviors. For example, previous research (Peck, Manning, Tri, Skrzypczynski, Summers, & Grubb, 2016; Uecker, Agotti, & Regnerus, 2008) shows that adolescents define sex differently depending on the context and identity-related motivations. Individuals opting for alternatives to maintain “virgin status,” and those who engage in same-sex sexual encounters (e.g., men who have sex with men), for example, might not consider all genital contact as constituting sex, and therefore are less likely to consider personal sexual risk in contexts that involve behaviors outside of their definition of “sexual intercourse.”

Furthermore, not all behaviors identified as important sexual risk indicators in extant literature are equally indicative of an overall profile of sexual risk. The mere presence of sexual behavior does not indicate that risky sexual behavior is occurring. For example, there is almost no association between number of partners and condomless sex acts (Barker et al., 2019), and exclusive relationships, while negatively associated with contraceptive use in adolescence, is positively associated with contraceptive use as individuals transition into early adulthood (Ashenurst, Wilhite, Harden, & Fromme, 2017). The results of this meta-analysis support the notion that consistency in measuring and reporting adolescent sexual risk should be a priority for this field of research. Barker and colleagues (2019) recommend, “(1) reporting each type of risk

behavior separately prior to forming a composite, (2) aggregating across assessments to increase the chance of observing sexual risk behaviors, and (3) continued work toward a unified definition of adolescent sexual risk behavior that can guide the development of appropriate measurement models,” (p. 2305); that call is echoed herein. Determining what behaviors are reliable indicators of risk and risk prevention should be a focus for future research.

Social Development Model

Catalano and colleagues (Catalano, Kosterman, Hawkins, Newcomb, & Abbott, 1996) propose that there are four distinct but interrelated constructs upon which the family, as an indispensable site of social influence and protective factor in mitigating risky behavior, depends: “(a) perceived opportunities for involvement in activities and interactions with others, (b) the degree of involvement and interaction, (c) the skills to participate in these involvements and interactions, and (d) the reinforcement they perceive as forthcoming from performance in activities and interactions,” (p. 431). These constructs emphasize the dynamic nature of the parent-child relationship, and the importance of dyadic interaction in establishing a parent-child relationship characterized by mutual understanding. It is through this bonding process that parents gain the ability to establish themselves as a reliable sources of information regarding sensitive and risk-related topics. Prosocial bonding facilitates the role of parents as models for desirable behaviors, norms, and values.

Regular, developmentally appropriate PCSC conversations not only provide the opportunity for children to establish a mutually influential bond with parents, these sites of social influence are integral to establishing healthy attitudes, beliefs, and habits regarding sexual health and relationships. Parents are the primary means of socialization and the origin for health-related behaviors (Tinsley, 1992), and so long as the messages included in PCSC conversations include

factual, relevant information, and explicit directives regarding *how* to mitigate personal sexual risk, children will enter adolescence and emerging adulthood well-equipped to make sound decisions regarding their own sexual behavior.

Family Communication Patterns

The parallels between family communication patterns theory (Koerner & Fitzpatrick, 2006) and the Social Development Model (Catalano et al., 1996) are plainly evident. A family high in conversation orientation facilitates bonding to the prosocial family; a family low in conversation orientation does not, and parental influence over beliefs, attitudes, and behaviors of children is limited, particularly once children reach adolescence and influence from peers and outside sources increases. The predictive power of a family's conformity orientation regarding sexual beliefs, attitudes, and behaviors is less clear, and deserves investigation. It is likely that PCSC messages higher in conformity lead to better adherence to parental directives regarding sexual behavior. Overall, parental communication should provide clear directives regarding the benefits of postponing sexual debut, but not undermine the positive aspects of sexual relationships. Parents should also provide personalized, factual information regarding sexual risk, and explicit direction on how to effectively engage in preventative measures. Whether or not parents encourage open, honest discussion and questioning about certain topics impacts children's knowledge and understanding of those topics as adults. Without engaging in conversations of this nature, children are ill-equipped at making decisions regarding their own well-being autonomously.

Practical Implications

When basic moderating factors are accounted for, the question of whether or not PCSC matters is unequivocally answered. The role of PCSC in adolescent sexual education and

socialization cannot be overstated, with the potential to influence sexual beliefs, attitudes, and behaviors both directly and indirectly. These interactions present an opportunity for intervention, as family communication is an undeniable site of social influence and functions as a protective factor in the mitigation of sexual risk (Catalano et al., 1996). PCSC is contextually bound, just as is every other communication topic. What is considered effective, appropriate, and ethical depends upon a number of factors, and in order to assess the effectiveness of any message, we must not undermine the importance of various contextual factors.

Advice for Parents

Parents play a pivotal role in determining sexual communication patterns between their children and future sexual partners. Open communication in general, but especially about sensitive topics, promotes connectedness to the parent (Catalano et al., 1996), and ensures the family unit as an important source of social influence. When it comes to giving advice to parents about how they should engage their own children in communication about sex, there are several key ideas that can be gleaned from results of the present study. Parents should engage their children in frequent, age appropriate conversations regarding personal hygiene, sexual maturation and puberty, reproduction, sexual risk and contraception, sexual identity, and sexual pleasure (Ashcraft & Murray, 2017).

Based on findings of the present meta-analysis, one piece of advice is certain: any conversation is better than no conversation at all. Additionally, conversations that occur frequently, and go in-depth on a variety of topics are more effective at preventing sexual risk and encouraging safer sexual behaviors than are conversations that lack detail, or than those big “sex talks” that only occur once. Conversations should especially focus on providing a detailed description of what various sexual acts entails, and how those acts lead to specific outcomes.

Conversations that include specific guidance and instruction on how to properly use contraceptives and how to engage in safe sex behavior are overwhelmingly more impactful in preventing sexual risk than are general conversations.

Additionally, conversations should include detailed discussions of actual risks associated with sexual activity, but necessitate a conversation for how to ameliorate such risk. In other words, conversations that stoke fear but do not recognize the fact that sex is an eventuality for most adolescents, and thus do not provide information necessary for adolescents to actually reduce their level of sexual risk are ineffective. While timing of conversations did not predict sexual risk as hypothesized, this does not negate the fact that multiple individual studies (e.g. Clawson & Reese-Weber, 2003) show this is an important factor. Furthermore, these data do support the notion that frequent, repeated conversations are more effective than a single conversation, and in order to realize the full potential of these conversations they should begin before onset of sexual activity, once sexually risky behaviors have already begun and are less likely to change. Finally, one of the most important pieces of advice the results of this study supports is the importance of the participation of a variety of adult role models in the sexual education of adolescents. The role of fathers, or male caregivers/role models, has often been neglected, and the burden of PCSC often falls primarily on the mother or female caregiver/role models. These messages need to come from a variety of sources, and should especially come from individuals familiar with the unique challenges and pressures faced by the child of focus.

Parents cannot wait for their children to demonstrate outward developmental indicators for these conversations to begin, and they cannot wait for their children to come to them with questions. Children, too, experience anxiety and embarrassment around such conversations, and once they reach adolescence they will follow their parents' lead, adhering to established family

communication patterns. Parents, not children, must be the ones to overcome and break the cycle of reciprocal hesitance in PCSC conversations. There will be discomfort, but that discomfort will be lessened dramatically by engaging these topics frequently, and taking advantage each and every learning opportunity as it occurs. The one-time, big “Birds and the Bees” conversation is an ineffective method of engaging in PCSC, and should be eschewed in favor of regular, developmentally appropriate conversations that cover a wide variety of topics, and present children with the opportunity to ask questions. Parents should not fear not knowing the answer to these questions, for we are all lucky enough to live in the Golden Age of Information, and the answers are at all of our fingertips. Furthermore, the opportunity to learn together, rather than approaching these conversations as instances of imparting information upon the child, promote further prosocial bonding to the family unit and will promote mutual respect and understanding in the parent-child relationship, even outside the context of PCSC.

Developing Intervention & Parent-Child Sexual Communication Education Programs

The single most important thing an intervention geared towards facilitating parent-child sexual communication can do is address the barriers parents experience that prevent them from having PCSC conversations. The bottom line about PCSC is that it needs to happen, and anything preventing that from happening should be addressed. First, experts should focus on communicating to parents that PCSC does not promote sexual activity in adolescents, and providing them with clear evidence supporting that notion. As long as parents communicate clearly and accurately to their children what their expectations are regarding sexual activity, and include direction on how to properly engage in risk prevention measures, PCSC is one of the most important protective factors in mitigating sexual risk. Parents are fearful that they lack the knowledge to adequately prepare their children for sexual relationships, and in many cases

they are correct to fear their own lack of knowledge (DuRant et al., 2006). Parents are often ill-equipped to communicate accurate information regarding sex and sexuality, and thus, prevention strategies must break the cycle of misinformation and subpar sexual education by educating parents first.

Limitations & Future Directions

Any attempt to synthesize a body of literature is limited by the quality and scope of extant literature. The body of literature concerning PCSC is expansive and diverse, but few studies account for the complexity of communication and PCSC messages. Results of this meta-analysis suggest that the lack of adequate measurement of the PCSC variable limits the ability to fully assess the impact of each dimension of PCSC on sexual risk and obfuscates observable effects. Future research should focus on understanding how PCSC conversations vary in terms of frequency, depth, breadth, content, and style/tone of conversation. Additionally, future research should seek to understand the effect of positive or negative valence of such messages, as well as the presence of opportunities for question asking on sexual behaviors. Specifically, future research should assess the impact of sex-positive and sex-negative messages on sexual risk, and investigate the co-occurrence of messages that highlight both sexual pleasure and sexual risk. Rather than relying entirely on self-report measures, content and thematic analysis of actual PCSC conversations is a worthwhile endeavor and would inform development of more reliable quantitative measures of the PCSC variable.

The present meta-analysis does not examine the role of general family environment or style of conversation (open, honest, dyadic in nature), a known correlate of sexual risk. While it was the original intention to include this as a moderator variable, upon examination of the literature it was concluded that this should be a separate meta-analysis. A number of studies

examine the relationship between general family communication or environment and sexual risk, but very few examine this variable in conjunction with PCSC specifically. Future research should assess the indirect and direct effect of general family environment and communication patterns on PCSC and sexual risk behaviors and outcomes. An additional limitation of this meta-analysis emerged throughout the coding process—there are additional factors that potentially act as additional important moderators. These factors include the age at which PCSC occurred; while some studies did note whether the PCSC occurred prior to or post onset of sexual activity, the overwhelming majority of studies do not report age of conversation. While it may be difficult to recall for some older participants when these conversations occurred, it is a worthwhile endeavor for those researching PCSC in the future to attempt to assess the impact of age at which conversations occur with regard to efficacy in promoting safe sex behavior. Another factor that was not accounted for was whether the report of PCSC and sexual risk factors was parent-reported or child/adolescent-reported. There were only a few effect sizes included in this meta-analysis that reflected parent-reported data, and thus this was not included as a moderating factor. However, there is a known discrepancy between parent- and child-reported data regarding PCSC (Flores & Barroso, 2018). Future research should attempt to capture differences between parent- and child-reported data, and seek to understand the implications of these discrepancies. For example, if parents remember the PCSC they engage in with their children more prominently than do their children, perhaps this is reflective of the efficacy of those conversations. Finally, one additional factor that emerged in this meta-analysis during the coding process as a potentially important moderator variable was the nature of the population sampled. Specifically, upon close inspection of individual studies some populations are noted as “at-risk” adolescents. These adolescents are not necessarily sexually at-risk, but rather they come from a geographic

area or cultural group (e.g. urban underserved youth, rural disadvantaged youth, youth from underrepresented groups, or those of first- or second-generation immigrant status). It is difficult to know how specific disadvantages impact particular groups within the context of sexual risk, but it is worth investigating, and may provide important insight regarding observed differences in ethnic/racial sampling categories.

In addition to limitations to this study specifically, there are limitations to meta-analytic methods in general which are important to keep in mind (Walker et al., 2008). Publication bias is worth mentioning, because studies that yield non-significant results are less likely to be published. In the future, reaching out to known researchers of PCSC in an attempt to collect unpublished data may be a fruitful endeavor. Second, no search process is without fault. Admittedly, once this meta-analysis was well underway, additional studies were uncovered by accident that were not included in this analysis. Sometimes misleading titles, or alternative language use—especially that used outside of the U.S.—can lead to a faulty search. Relatedly, there were a number of studies not included because they did not include usable data. Data reported were not able to be extracted due to lack of conversion techniques available. Improvement upon the present analysis would involve contacting those study authors personally for raw or extractable data.

Conclusion

This study examines the effect of parent-child sexual communication on sexual risk behaviors and outcomes during adolescence and emerging adulthood. A meta-analytic review of existing research allowed for quantitative synthesis of 149 independent effect sizes, reflecting over one hundred thousand adolescent experiences with parent-child sexual communication. Results confirm a small, but meaningful association between PCSC with sexual risk, such that

individuals who engage in PCSC are more likely to engage in risk prevention strategies (e.g., consistent condom use, use of oral contraceptives), less likely to engage in sexually risky behaviors, and less likely to experience outcomes associated with sexual risk such as unplanned pregnancy and STI diagnosis. A number of factors were shown to moderate the relationship between PCSC and sexual risk, including extent of communication, the topics covered in PCSC interactions, the specific risk outcome (i.e., dependent variable assessed), the timing of the interaction, biological sex of the adolescent, the dyadic composition of the parent-child interaction (e.g., mother-daughter, father-son), and the racial or ethnic makeup of the sample. Specifically, the frequency, depth, and breadth of PCSC interactions, and inclusion of descriptive/instructional and contraception/risk information are associated with a reduction in sexual risk.

PCSC appears to be most effective in promoting communication-based risk reduction strategies and barrier contraceptive use, and contributes to lower incidence of unplanned pregnancies. PCSC is moderately associated with composite safe sex or sexual risk scores, indicating that taking an individual's entire risk profile into account is important when assessing the overall impact of PCSC on sexual risk, and highlighting the notion that sexual risk does not manifest identically at the individual level. Racial/Ethnic makeup of sample population as a moderator variable indicates there are important cultural group level differences in norms and attitudes regarding sexual attitudes, beliefs, and behaviors. PCSC is far more effective in promoting safe sex behaviors and decreasing sexual risk when it occurs in same-sex parent-child dyads, and this should encourage all parents to take an active role in their child's sex education. Advice for parents and researchers alike highlights the importance and complexity of message construction, as well as the need for clear, specific directives regarding sexual health and even

discussion of sexual pleasure. The family unit is a significant site of social influence and should strive to facilitate adolescent bonding to the prosocial family; establishing open, honest dyadic interactions regarding sex-related topics as the norm allows parent-child sexual communication to act as a protective factor against sexual risk throughout adolescence and emerging adulthood.

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*denotes manuscript supplying data used in the analysis

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Table 2

Comprehensive List of Studies Included, Corresponding Effect Sizes, and Moderator Variable Coding

Effect	Authors (Year)	n	r	Extent	Content	Timing	Risk (DV)	Sex	Dyadic Comp.	Race or Ethnicity
1	Ancheta et al. (2005)	113	.05	3	3	3	1	1	1	5
2		113	.05	2	3	3	1	1	1	5
3		113	.07	3	3	3	4	1	1	5
4		113	.06	3	3	3	4	1	1	5
5		113	.06	2	3	3	4	1	1	5
6	Aronowitz et al. (2005)	39	.17	4	3	3	5	1	5	3
7		39	.35	4	3	3	5	1	5	3
8	Aspy et al. (2007)	1050	.04	3	2	3	1	3	1	1
9		1036	.03	3	2	3	1	3	1	1
10		1067	.01	3	2	3	1	3	1	1
11		1080	-.11	3	3	3	1	3	1	1
12		1080	-.05	3	3	3	1	3	1	1
13		1078	.00	3	3	3	1	3	1	1
14		1078	.07	3	2	3	1	3	1	1
15		1080	-.06	3	3	3	1	3	1	1
16		326	.04	3	2	3	3	3	1	1
17		327	.03	3	2	3	3	3	1	1
18		336	.10	3	2	3	3	3	1	1

19	338	.10	3	3	3	3	3	3	3	1	1
20	337	.08	3	3	3	3	3	3	3	1	1
21	337	.04	3	3	3	3	3	3	3	1	1
22	337	.05	3	2	3	3	3	3	3	1	1
23	337	.05	3	3	3	3	3	3	3	1	1
24	554	.03	1	3	1	1	3	3	3	1	4
25	554	.10	1	3	1	2	3	3	3	1	4
26	232	.17	1	3	2	1	3	3	3	1	4
27	232	.07	1	3	2	2	3	3	3	1	4
28	887	-.09	4	5	1	1	3	3	3	1	1
29	887	-.14	4	5	1	1	3	3	3	1	1
30	1279	.01	3	4	3	1	1	1	2	2	3
31	1669	.04	3	4	3	1	2	3	3	3	3
32	1175	.04	3	4	3	1	1	2	3	3	3
33	1249	.01	3	4	3	1	2	3	3	3	3
34	890	-.01	3	4	3	1	1	2	3	3	3
35	1133	.11	3	4	3	1	2	3	3	3	3
36	1075	.06	3	4	3	1	1	2	3	3	3
37	1288	-.03	3	4	3	1	2	3	3	3	3
38	1279	.01	3	3	3	1	1	2	3	3	3
39	1669	.15	3	3	3	1	2	3	3	3	3
40	1175	.01	3	3	3	1	1	2	3	2	3

Atienzo et al. (2009)

Bersamin et al. (2008)

Biddlecom et al. (2009)

41	1249	.07	3	3	3	1	2	3	3
42	890	-.06	3	3	3	1	1	2	3
43	1133	.00	3	3	3	1	2	3	3
44	1075	.04	3	3	3	1	1	2	3
45	1288	.06	3	3	3	1	2	3	3
46	290	.14	3	4	3	3	1	2	3
47	403	-.04	3	4	3	3	2	3	3
48	184	.15	3	4	3	3	1	2	3
49	118	.02	3	4	3	3	2	3	3
50	174	.07	3	4	3	3	1	2	3
51	406	.07	3	4	3	3	2	3	3
52	250	.09	3	4	3	3	1	2	3
53	390	.08	3	4	3	3	2	3	3
54	290	.03	3	3	3	3	1	2	3
55	184	.06	3	3	3	3	1	2	3
56	118	-.07	3	3	3	3	2	3	3
57	174	-.04	3	3	3	3	1	2	3
58	406	-.05	3	3	3	3	2	3	3
59	250	.03	3	3	3	3	1	2	3
60	133	.65	1	5	3	2	3	1	1
61	1206	.28	3	3	3	2	1	2	1
62	85	-.02	2	3	3	1	1	2	3

Booth-Butterfield & Sidelinger (1998)

Bradley et al. (2013)

Crosby et al. (2009)

63		85	.14	2	3	3	1	1	2	3
64		110	.07	2	3	3	2	1	2	3
65		50	.04	2	3	3	2	1	2	3
66		85	.16	2	3	3	4	1	2	3
67	DePadilla et al. (2011)	301	.14	1	3	3	2	1	2	3
68		400	.31	1	3	3	2	1	2	3
69	DiClemente et al. (1996)	148	.05	1	3	3	2	3	1	3
70	DiClemente et al. (2001)	522	.07	1	5	3	2	1	2	1
71	DiIorio et al. (2000)	1349	.07	2	5	3	2	3	1	1
72	Donenberg et al. (2011)	81	.06	4	5	2	2	1	5	3
73	Furstenberg et al. (1984)	105	.25	1	3	3	3	1	5	6
74	Gillmore et al. (2011)	10131	.01	1	5	3	2	3	1	1
75	Hacker et al. (2000)	559	.27	1	3	3	2	3	1	1
76	Hadley et al. (2009)	198	.12	2	5	3	2	3	4	3
77	Haley et al. (2013)	613	.01	4	5	3	2	3	1	1
78		613	-.08	4	5	3	1	3	1	1
79		613	.00	4	5	3	1	3	1	1
80		613	.06	4	5	3	3	3	1	1
81		613	.00	4	5	3	2	3	1	1
82	Heister (2001)	176	.12	2	5	3	1	3	4	2
83		176	.10	2	5	3	1	3	7	2
84	Holtzman & Rubinson (1995)	8098	.09	3	3	3	1	3	1	1

85		8098	.11	3	3	3	2	3	1	1
86	Hutchinson (2002)	234	.26	1	5	1	2	1	2	5
87		234	.05	1	5	1	6	1	2	5
88	Hutchinson & Cooney (1998)	173	.27	1	5	3	2	1	4	6
89		173	.31	1	5	3	4	1	4	6
90		173	.18	1	5	3	4	1	4	6
91		173	.17	1	5	3	2	1	7	6
92		173	.18	1	5	3	4	1	7	6
93		173	.15	1	5	3	4	1	7	6
94	Hutchinson et al. (2003)	219	.20	3	3	3	2	1	5	5
95		219	.22	3	4	3	1	1	5	5
96	Isaacs (2012)	326	.15	1	3	3	2	3	1	1
97		326	.14	1	2	3	3	3	1	1
98		326	.15	1	3	3	7	3	1	1
99		326	.16	1	2	3	7	3	1	1
100		326	.25	1	1	3	7	3	1	1
101		326	.15	1	1	3	6	3	1	1
102		326	.15	1	2	3	6	3	1	1
103	Jaccard et al. (1996)	488	.10	1	3	3	3	3	4	3
104	Kapungu et al. (2010)	162	.03	4	5	3	2	3	4	3
105	Khurana (2012)	5472	.07	1	5	3	1	3	4	1
106		5472	.03	1	5	3	2	3	4	1

107		5472	.01	1	5	3	6	3	4	1
108	Leland & Barth (1993)	445	.15	3	3	3	5	3	1	1
109		445	.23	3	3	3	5	3	1	1
110		445	.26	3	3	3	5	3	1	1
111	Luster & Small (1994)	986	.22	1	3	3	5	1	5	1
112		986	.14	1	3	3	5	1	8	1
113		922	.16	1	3	3	5	2	6	1
114		922	.18	1	3	3	5	2	9	1
115	Miller, Norton et al. (1998)	235	.14	3	3	3	1	2	3	2
116		238	-.15	3	3	3	1	1	2	2
117	Miller, Levin et al. (1998)	122	.32	3	3	1	2	3	4	5
118		78	.17	3	3	1	2	3	4	5
119		63	.12	3	3	1	2	3	4	5
120	Newcomer & Udry (1985)	197	.04	3	4	3	1	2	6	1
121		192	.02	3	4	3	1	2	6	1
122		203	.03	3	3	3	1	2	6	1
123		201	.04	3	3	3	1	2	6	1
124		260	.10	3	4	3	1	1	5	1
125		255	.07	3	4	3	1	1	5	1
126		269	-.07	3	3	3	1	1	5	1
127		269	.04	3	3	3	1	1	5	1
128	Rodgers (1999)	189	.05	1	3	3	5	1	2	2

129	183	.06	1	3	3	5	2	3	2
130	255	.14	3	4	3	1	3	4	2
131	164	-.05	3	4	3	3	3	4	2
132	164	.13	3	4	3	3	3	4	2
133	164	.10	3	4	3	3	3	4	2
134	250	-.06	3	4	3	1	3	7	2
135	164	-.06	3	4	3	3	3	7	2
316	164	.00	3	4	3	3	3	7	2
137	164	.05	3	4	3	3	3	7	2
138	332	.10	3	4	3	1	1	2	1
139	332	-.04	4	5	3	1	1	5	1
140	332	-.02	4	5	3	1	1	8	1
141	332	.09	3	4	3	1	1	2	1
142	332	-.01	4	5	3	1	1	5	1
143	332	-.02	4	5	3	1	1	8	1
144	190	-.15	3	4	3	1	2	3	1
145	190	-.12	4	5	3	1	2	6	1
146	190	-.16	4	5	3	1	2	9	1
147	190	-.16	3	4	3	1	2	3	1
148	190	.25	4	5	3	1	2	6	1
149	190	.37	4	5	3	1	2	9	1

Tupa (1999)

Zamboni & Silver (2009)

BRITTNIE S. PECK

ACADEMIC APPOINTMENTS

- University of Kentucky**, Lexington, KY
Lecturer, Department of Communication August, 2019-Present
- University of Wisconsin- Milwaukee**, Milwaukee, WI
Graduate Teaching Assistant, Department of Communication August, 2014-May, 2019
- Northern Illinois University**, DeKalb, IL
Graduate Teaching Assistant, Department of Communication August, 2012-May, 2014

EDUCATION

- University of Wisconsin, Milwaukee Milwaukee, WI
Doctor of Philosophy, Communication Studies
Dissertation title:
Parent-child communication about sex as a predictor of sexual risk behaviors: A meta-analytic review
December, 2020
- Northern Illinois University DeKalb, IL
Master of Arts, Communication Studies
August, 2014
- University of Tennessee Knoxville, TN
Bachelor of Arts, Communication Studies
December, 2011

RESEARCH

PUBLISHED WORK

- Allen, M., Bourhis, J., Burrell, N., Adebayo, C., Benedict, B., Cherney, M., Langston, D., **Peck, B. S.**, Quinn, S., & Richards, R. (2018). Evaluation of communication Master's Program on the basis of Google citations. *Journal of the Association for Communication Administration*, 36, 51-69
- Motel, L., & **Peck, B. S.** (2018). SexIER symbols: Examining the effects of a content analysis of gendered visual imagery in cross cultural road signs. *Journal of Intercultural Communication*, 18.

- Cole, A. W., Anderson, C., Bunton, T. E., Cherney, M. R., Cronin Fisher, V., Draeger Jr., R., Fetherston, M., Motel, L., Nicolini, K. M., **Peck, B. S.**, & Allen, M. (2017). Student predisposition to instructor feedback and perceptions of teaching presence predict motivation toward online courses. *Online Learning*, 21, 245-262.
- Ruppel, E. K., Gross, C., Stoll, A., **Peck, B. S.**, Allen, M., Kim, S-K. (2017). Reflecting on connecting: Meta-analysis of differences between computer-mediated and face-to-face self-disclosure. *Journal of Computer Mediated Communication*, 22, 18-34.
- Peck, B. S.** (2017). Delayed measurement. In M. Allen (Ed.), *The Sage encyclopedia of communication research methods*. Thousand Oaks, CA: Sage.
- Peck, B. S.** (2017). Multi-trial design. In M. Allen (Ed.), *The Sage encyclopedia of communication research methods*. Thousand Oaks, CA: Sage.
- Peck, B. S.** (2017). Random sampling. In M. Allen (Ed.), *The Sage encyclopedia of communication research methods*. Thousand Oaks, CA: Sage.
- Peck, B. S.** (2016). Family communication patterns and talking about sex. In McCornack, S., Sahlstein Parcell, E., Timmerman, L., Baker, B. A., Cronin-Fisher, V., Dorsett, N. A., Jagiello, K. L., Johnson, R. L., & Peck, B. (2016). *Reflect and relate: An introduction to interpersonal communication* (3rd ed. CUSTOM). Boston MA: Bedford/St. Martin's.
- Peck, B. S.**, Manning, J., Tri, A., Skrzypczynski, D., Summers, M., & Grubb, K. (2016). What do people mean when they say they “had sex”? Connecting communication and behavior. In J. Manning & C. M. Noland (Eds.), *Contemporary studies in sexuality & communication: Theory and practice* (pp. 3-13). Kendall Hunt.
- Peck, B. S.**, Christen, S., & Kelly, S. (2014). Using “The Big Bang Theory” to make a big impact: Explaining theory guided research. *Discourse: The Journal of the SCASD*, 1, 45-50.

CONFERENCE PRESENTATIONS

- Peck, B. S.**, & Jagiello, K. (November, 2018). Sexual risk in LGB population in emerging adulthood. Paper presented at the annual meeting of the National Communication Association, Salt Lake City, Utah.
- Peck, B. S.**, & Richards, R. (April, 2018). Sexting in romantic relationships: A critical synthesis of extant literature. Paper presented at the annual meeting of the Central States Communication Association, Milwaukee, Wisconsin.
- Peck, B., & Sahlstein Parcell, E. (2018, April). *Mental health and military marriage: Dilemmas faced in necessary conversations*. Presentation made to the Military Family Research Institute (MFRI) at Purdue University, West Lafayette, Indiana.

- Peck, B.**, Sahlstein Parcell, E., Klasen, W. (November, 2017). Marital mental health conversations in military families: Dilemmas faced in necessary conversations. Paper presented at the annual meeting of the National Communication Association, Dallas, Texas.
- Peck, B. S.**, & Dellinger, J. B. (November, 2017). Traditional knowledge and health-related beliefs and behaviors: Measuring intergenerational transmission of knowledge in the Anishinaabe of North America. Paper presented at the annual meeting of the National Communication Association, Dallas, Texas.
- Allen, M., Baker, B. M. A., Jagiello, K., Cherney, M., Motel, L., & **Peck, B. S.** (March, 2017). Head orientation during confrontations during the Presidential primary debates. Paper presented at the annual meeting of the Central States Communication Association, Minneapolis, MN.
- Gross, C., & **Peck, B. S.** (November, 2016). Confronting the problem: A meta-analytic review of the effectiveness of bullying intervention programs in schools. Paper presented at the annual meeting of the National Communication Association, Philadelphia, PA.
- Peck, B. S.**, & Lenox, T. R. (October, 2016). Challenging hegemonic discourses of women's rights: The use of Carnavalesque strategies on Reddit. Paper presented at the annual meeting of the Organization for the Study of Communication, Language, and Gender, Chicago, IL.
- Peck, B.**, Fylling, S. Q., & Dorsett, N. (March, 2016) Disclosing sexual fantasy within committed and casual romantic relationships. Paper presented at the annual meeting of the Central States Communication Association, Grand Rapids, MI.
- Peck, B.**, Kelley, P., Rhea, T., McCaskill, S., & Tidwell, H. (April, 2013). Distinguishing between sex and gender: The effects of dyadic gender and sex compositions on uncertainty reduction. Paper presented at the annual meeting of the Gender Matters conference, Chicago, IL.
- Christen, S., Buchanan, B., Burke, K., & **Peck, B.** (April, 2013). Immediacy on RMP. Searching for immediacy on RateMyProfessors.com: Investigating students' feedback to identify quality of instructional communication assessment. Paper presented at the annual meeting of the Southern States Communication Association, Louisville, KY.
***Awarded Top Paper, Student Division**
- Kelly, S., **Peck, B.**, & Christen, S. (April, 2012). Demonstrating the role of theory in research. Presented at the annual meeting of the Southern States Communication Association, San Antonio, TX.

MANUSCRIPTS IN PROGRESS

Peck, B., & Sahlstein Parcell, E. (under review) Talking about mental health: Dilemmas U.S. military service members and spouses experience post deployment.

Peck, B., & Allen, M. Parent-child communication about sex as a predictor of sexual risk behaviors: A meta-analytic review.

Peck, B. S., & Dellinger, J. B. Traditional knowledge and health-related beliefs and behaviors: Measuring intergenerational transmission of knowledge in the Anishinaabe of North America.

Cronin Fisher, V., **Peck, B. S., & Stoll, A.** Evaluating the Role of Doctor/Patient Communication in Meeting Recommended Standards for Perinatal HIV Screening: Implications for Physician Practice and Prevention Intervention.

Gross, C., & **Peck, B. S.** Confronting the problem: A meta-analytic review of the effectiveness of bullying intervention programs in schools.

Peck, B. S., Fylling, S. Q., & Dorsett, N. Disclosing sexual fantasy within committed and casual romantic relationships.

TEACHING EXPERIENCE

Lecturer
University of Kentucky
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August, 2019-Present

Patient/Provider Communication
COM 311 (face-to-face & online)

Interpersonal Communication in Close Relationships
COM 313 (face-to-face & online)

Intro to Interpersonal Communication
COM 252 (face-to-face, hybrid, & online)

Graduate Teaching Assistant
University of Wisconsin, Milwaukee
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August, 2014-May, 2019

Nonverbal Communication
COMMUN 320, Instructor of Record

Interpersonal Communication
COMMUN 101, Instructor of Record

Business and Professional Communication (online & face-to-face)
COMMUN 105, Instructor of Record

Interpersonal Communication
COMMUN 101, Discussion section instructor

Graduate Teaching Assistant,
Northern Illinois University
Introduction to Public Speaking
COMS 100, Instructor of record
August, 2012-May, 2014
DeKalb, IL

Interpersonal Communication
COMS 303, TA for Dr. Betty La France

Teaching Assistant,
University of Tennessee
Research Methods
CMST 356, TA for Dr. Stephanie Kelly
September, 2011- May, 2012
Knoxville, TN

Communication Theory
CMST 352, TA for Dr. Stephanie Kelly

PROFESSIONAL SERVICE

Committee member for the development of continuing education for health care professionals,
University of Kentucky, Department of Communication, 2019-present

Reviewer for Kentucky Conference on Health Communication, 2020

Mentor for incoming PhD students at University of Wisconsin- Milwaukee, 2015-2019

Reviewer for NCA GIFTS division submissions, 2016-2017

Reviewer for NCA Family Communication Division, 2018

Reviewer for Journal of Aging and Health, 2018

Communication Graduate Student Council, University of Wisconsin- Milwaukee, Treasurer
Grant writer and organizer for Professional Development seminar with Dr. Mary Lynn Henningsen, Northern Illinois University, February, 2017

Respondent for paper panel: The Impact of Social Media on Interpersonal Relationships
CSCA 2017, Minneapolis, MN

Presenter and Activity Facilitator for Educator and Parent Education on School Bullying at the
Bay View Public Library, Milwaukee, WI, 2015

GradCOMM of Northern Illinois University, Executive Board member, Academic representative
Grant writer and organizer Fall 2013 GradCOMM Colloquium, The “Living On” Project: A Photo documentary of Holocaust survivors and Liberators, presented by Professor Robert Heller of the University of Tennessee, Knoxville

PROFESSIONAL AFFILIATIONS

Member, National Communication Association, 2011-Present
Member, Central States Communication Association, 2014-2018
Member, Southern States Communication Association, 2012-2014

AWARDS AND RECOGNITIONS

Paul K. Crawford Outstanding Graduate Student Award in Recognition of Distinguished
Scholarship

Martha D. Cooper Teaching Assistant Award for Outstanding Performance and Peer Leadership
Northern Illinois University, Communication Studies Program
April 27, 2014

Top Paper Award, Student Division
Annual meeting of the Southern States Communication Association, Louisville, KY
April, 2013

PROFESSIONAL REFERENCES

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