# Exploring the Relationship Between Adolescent Media Use, Sexual Socialization and Sexual Behavior

By

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# DEDICATION

To Sean William, II, Ian Wesley, and Kohl Wynton;

to my parents, Cassandra and McGahee, Sr.;

to my ancestors and anSister, Lasana, upon whose shoulders I stand;

and at last, to my own self – past, present, and future.

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# CHAPTER 1

## Introduction

While there is little consensus and significant variations across definitions (Curtis, 2015), adolescence commonly refers to the developmental period marked by the transition of individuals from childhood to adulthood and is a time when youth undergo rapid development and growth in the cognitive, affective, motivational, physical, and social domains. Globally, over one billion individuals are in adolescence. As sweeping advances and innovations in information technology are widely adopted, increasing and improving the scientific understanding of the experiences of adolescents and their interactions in the world is of importance to understanding and intervening upon human development, overall (Dahl, Allen, Wilbrecht, & Suleiman, 2018).

Biological, psychological, and social factors – including socialization – all contribute to human development (Office of Disease Prevention and Health Promotion, 2015) and are particularly important during adolescence. Socialization refers to "the way in which individuals are assisted in becoming members of one or more social groups" (Grusec & Hastings, 2007, p. 1). Across various disciplines, multiple theorists attempt to describe how social influences shape youths' sexual behavior, health, and sex-related outcomes as they develop over the life course. During this critical developmental period, media emerges among other social influences and functions as a salient source of sexual socialization for adolescents.

Myriad studies describe the link between the use of media (i.e., television, radio, video, print media, Internet) and youth sexual attitudes, intentions, behaviors, and health statuses (Brown & L'Engle, 2009; Collins, et al., 2004; L'Engle & Jackson, 2008; Pardun, L'Engle, & Brown, 2005; Strasburger, Jordan, & Donnerstein, 2010; Wingood, et al., 2003). Media now

contain more sexual material than during previous decades, and studies link mass media exposure and use to the initiation, persistence, and progression of sexual behaviors across adolescence (Villani, 2001). In recent years, content analyses of popular music (Hall, West, & Hill, 2012), music videos (Wallis, 2011), television (Kunkel, et al., 2007), movies (Potts & Belden, 2009), video games (Stermer & Burkley, 2012), print (Reichert & Carpenter, 2004) and other media show that a substantial amount of sexualized content - often more than in previous decades – is incorporated into conventional media, and media contains more intensified sexually-explicit or degrading images and messages than ever before. Studies show that listening to popular music – and in particular, the type that contains sexually-explicit or degrading lyrics – is linked to the early sexual initiation in youth and their progression to more advanced sexual activities over the course of their development (Martino, et al., 2006; Primack, Douglas, Fine, & Dalton, 2009). Similarly, adolescent viewing of sexual content in popular movies is linked to early sexual debut and engagement in sexual risk behaviors (O'Hara, Gibbons, Gerrard, Li, & Sargent, 2012).

While existing research establishes that media has a role as a sexual socializer for adolescents, little is known about its long-term effects on sexual development, and about how social factors, such as race, gender, class and sexual attraction moderate this relationship. There is a great need for research that explores media socialization processes, related antecedent and co-occurring factors, and how these factors all coalesce to influence adolescent sexual development. Further, longitudinal study designs and analyses are needed that offer insight into how media use relates to sexual socialization and behavior as adolescents move across the life course toward adulthood.

The goal of this three-paper dissertation is to better understand the role of media as a socializing agent, among, and at the intersections of other social influences in the lives of adolescents. Broadly, I ask the following research question: what is the role of media in adolescent sexual socialization and development, and relative to other social factors? My research is grounded in a cross-disciplinary, bioecological framework for adolescent media sexual socialization (BFAMSS) (Bethune, 2016), in which I situate media among other social influences and in the context of biological and psychological processes that take place throughout adolescence. Intersectionality theory, as posited by Kimberlé Crenshaw (1991), and as discussed by Patricia Hill Collins (Collins & Bilge, 2016), also serves as an important conceptual and analytical framework informing my analyses.

Chapter 2 consists of a review of theoretical perspectives relevant to adolescent sexual socialization, and introduces the conceptual framework that guides this dissertation. Life course perspectives, social ecological frameworks, and media effects theories form the foundation of the bioecological framework for adolescent media sexual socialization that serves as a conceptual framework for the analyses that follow.

During adolescence, media emerge as salient sources of socialization, as adolescents gain increased capacity to perceive their environments and social worlds. Chapter 3 features the first analysis, which examines the relationship between adolescent media use and sexual socialization later in adolescent development. Using quantitative analysis of secondary data, this study is the first to date to explore the relationship between adolescent conventional media use and sexual socialization longitudinally, considering also the roles of race, gender, and socioeconomic status.

While much of the literature on adolescent sexual initiation focuses primarily or solely on vaginal-penetrative sex, sparse research considers media's influence on the initiation of

additional diverse sex behaviors. The second analysis in this dissertation is presented in Chapter 4, and explores how race, gender, the interactions of these social factors influence the relationship between adolescent media use and the initiation of vaginal, oral, and anal sex behaviors across adolescence and early adulthood. This study examines the enduring effect of opposite-sex-attracted adolescents' media use on the timing of initiation of sexual behaviors.

Little is known about whether and how the onset of various sex behaviors during adolescence differs for queer (e.g., gay, lesbian, bisexual) youth. The third analysis, presented in Chapter 5, builds on Chapter 4's analysis, exploring the relationship of race, gender, class and media use to the initiation of diverse sex behaviors in a sample of same sex-attracted youth.

Finally, Chapter 6 provides a summary of findings, describing the overall insights gleaned across the analyses. Then, I discuss the practical implications of the findings, the relevance of my findings for policy and intervention, remaining gaps and future directions for research examining adolescent media sexual socialization. Each of chapters 3, 4, and 5 are composed as standalone manuscripts that are formatted for future publication.

This dissertation aims to elucidate the unique and complicated role that media play in developing, socializing, and priming youth for sex. I consider the notion that various media are influential in the lives of youth, but to varying degrees at intersections of race, gender, and other sociodemographic factors. I also contend that media use during the impressionable time of adolescence has long-term implications for sexual socialization and behavior across the life course. This dissertation contributes to the literature by providing a more comprehensive and contextualized examination of media, adolescent sexual socialization and sexual behavior, using longitudinal data and quantitative analyses.

## The Larger Study: National Longitudinal Study of Adolescent Health

This dissertation uses data from the National Longitudinal Study of Adolescent Health (Add Health)[1]. Add Health is the largest and most comprehensive survey of adolescents undertaken in the United States. The initial wave of data collection for the study began in 1994 with the Wave 1 in-school questionnaire, administered to a nationally-representative group of over 90,000 middle- and high-schoolers from a sample of 80 high schools and 52 middle schools from the U.S. selected with unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured that this sample is representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. Of those students, a portion were selected to participate in an in-home interview in the same time period (1994-1995). The initial wave consisted of the in-school and in-home questionnaires, vocabulary data, spatial data, school administrator responses and a parent questionnaire, and was followed up by three more data collection periods to date: Wave 2, 1996; Wave 3, 2001; and Wave 4, 2008 (Harris, et al., 2009). Data from Waves 1 and 2 are used in Chapter 3 of this dissertation, and data from Waves 1 – 4 are used in Chapters 4 and 5. Due to the incompatibility of the statistical software used for the analyses included in this dissertation with the sampling weights intended for use, the data in my analyses do not carry the representativeness of the larger study's design. Rather, the public-use data that I use, sans the sampling weights, constitute a sample that is generalizable only to the participants included in each analysis. An extensive literature review was conducted to inform the analyses in this

[1] This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis.

dissertation, as well as to ensure that the research questions posed and methods to address them were not yet published using Add Health data.

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CHAPTER 2

# A Bioecological Framework for Adolescent Media Sexual Socialization

## Introduction

"Adolescent," "child," "teenager," "young person," and "young adult" are all terms that are used to describe individuals who are at the stage of development in preparation for adulthood. Adolescence commonly refers to the developmental period marked by the transition from childhood to adulthood and is a time when youth develop biologically, psychologically, and socially. Adolescence typically starts with the onset of puberty – a period between approximately 10 to 19 years of age when individuals experience increased cognitive capacity and undergo physical and social-role maturity (Sawyer, et al., 2012). The timing of adolescence is evolving for the new-age "millennials" as a result of earlier pubertal debut and delayed social maturation for this population. Still, during this transition, multiple life pathways and processes undergo either stabilizing continuity across lifelong trajectories or disruptive departure from previous development (Johnson, Crosnoe, & Elder, Jr., 2011). These complex, dynamic biological and psychological processes take place across adolescence, all while adolescents navigate and interact with their changing social environment.

Adolescents receive complex and, at times, conflicting messages, signals, and cues via multiple developmental and socialization processes. Socialization refers to "the way in which individuals are assisted in becoming members of one or more social groups" (Grusec & Hastings, 2007, p. 1). Grusec and Hastings identify multiple outcomes of socialization, including the adoption of rules, roles, standards and values of a group's social, emotional, cognitive and

personal dynamics. Various socialization processes (e.g. rituals, routines, formal education, modeling, etc.) are facilitated by socialization agents, such as parents, teachers, peers, family members, schools, media/Internet, communities and other social institutions. Socialization is best understood while also considering how biological and sociocultural factors interact and intertwine, shaping the complex lives of individuals over the life course.

Adolescence presents several opportunities for sexual socialization. During this time, adolescents develop sex knowledge, skills, and attitudes, make decisions about sex, and negotiate opportunities to engage in sex behaviors. These processes – collectively referred to as sexual socialization – take place in the social contexts in which adolescents acquire sexual knowledge and experiences (Tolman & McClelland, 2011). Youth sexual socialization can cover a broad range of topics, including dating and relationships, sex-related attitudes and behaviors, physical development and health, sexual orientation and sexual identity, and moral or religious issues regarding sexuality (Lefkowitz & Stoppa, 2006). Through sexual socialization processes, youth develop ideas and expectations about sexual behavior, health, development and identity, exploring what to think, how to feel, and how to behave sexually. Sexual socialization processes are critical as youth are confronted with risky sexual situations at increased rates during adolescence and throughout early adulthood.

Adolescents develop sexually in multiple contexts that span multiple levels of social organization. Individuals engage in interactions and processes within their social environments, acquiring knowledge, skills, motivation, behaviors and abilities over the life course (Bronfenbrenner & Morris, 2006). For adolescents, the social influences most proximal to them in the most immediate contexts shape their lives via dynamic, fluid and complex interactions. Amidst family, school, and community contexts, various forms of media emerge as a major

social influence in the lives of youth, especially as it relates to shaping their sexual attitudes, intentions and behaviors (L'Engle, Brown, & Kenneavy, 2006). Media are vehicles through which a shared set of meanings are produced, exchanged, and circulated within a cultural group or across society (Hall S. , 1997).

In the following section, I review three major human development perspectives that pertain to adolescent sexual socialization – life course theories, social ecological frameworks, and media effects theories – integrating the insights and culminating in the bioecological framework for adolescent media sexual socialization (BFAMSS). In the new framework, adolescent media socialization is central, and its direct effects on sexual development are postulated. Other important sources of adolescent socialization and developmental factors are reflected in the context of media sexual socialization.

## Life Course Perspectives on Adolescent Sexual Socialization

Lifespan development is the field of study that "examines patterns of growth, change, and stability in human behavior that occur throughout the entire lifespan" (Feldman, 2014, p. 5). Developmentalists concerned with how humans grow to achieve developmental milestones, sustaining and modifying behaviors over the life course focus on four major areas of human development: (1) physical– the body's makeup; (2) cognitive– growth and change in an individual's intellectual capacities; (3) personality– stability and change in the enduring characteristics that differentiate one individual from another; and (4) social – the ways in which individuals' relationships and interactions with others grow, change and remain stable over the life course. A life course perspective, therefore, considers multiple dimensions of human

development over the lifespan and places adolescence in the second decade of life during the transition from childhood to early adulthood.

Within the life course perspective, biopsychosocial theories of human development attempt to explain how youth develop physically, psychologically and in relation to their social worlds across adolescence. In adolescence, young people undergo accelerated development towards both physical and social-role maturation. One of the biological hallmarks of puberty is elevated secretion of gonadal steroid hormones that spur physical growth and the maturation of the reproductive system, rendering individuals capable to reproduce (Sisk & Zehr, 2005). During puberty, adolescent bodies are microcosmic sites of these dynamic hormonal changes that lead to distinctive markers of physical maturation, including body hair growth; increased perspiration and oil production in skin; increased physical growth; breast and hip development and onset of menses in girls; and growth of testicles, wet dreams, and deepening of voice in boys (Sawyer, et al., 2012).

During puberty, youth undergo psychological transformations as they develop the capacities to cogitate, comprehend, and emote in ways that are useful for the developmental tasks of adulthood. Adolescents develop increased intellectual competence, becoming increasingly capable at reasoning, processing information, acquiring expertise, and also along dimensions of arousal, emotion, and motivation as they pass through puberty (Steinberg, 2005). At the onset of puberty, adolescents also undergo changes in their socio-emotional brain functioning, which result in increased reward- and sensation-seeking in youth. Later in adolescence and emerging adulthood, shifts occur in the cognitive control brain system, resulting in improved capacity for self-regulation (Steinberg, 2008). Puberty and other transitions during adolescence are intricately

linked to each other, largely due to hormonal changes that impact physical growth, as well as shifts in brain functioning.

Hormonal activation, structural changes in brain physiology, and shifts in brain functioning all influence the social behaviors and interaction of youth across adolescence and into early adulthood. For example, the same gonadal steroid hormones that activate physical growth in adolescents are also integral in structuring cortical and limbic circuits in the brain that enable adult-like cognitions, decision making strategies, and social behaviors (Sisk & Zehr, 2005). Changes in brain physiology during this critical period transform the brain's social information processing network (Mills, Lalonde, Clasen, Giedd, & Blakemore, 2014), impacting how youth behave and how they process their social interactions (Nelson, Leibenluft, McClure, & Pine, 2005). Hormonal changes, such as increases in testosterone levels, are linked to the development of socially-determined motivations in youth (Dahl & Forbes, 2015). During adolescence, youth develop the motivation to attain higher status, and thus become progressively more interested in their perceived social status, popularity and group-level belonging (LaFontana & Cillessen, 2010). In regard to sexual motivations and goals, adolescents have strong expectations regarding sex and its role in achieving social status, pleasure and intimacy (Ott, Millstein, Ofner, & Halpern-Felsher, 2006). The ways youth experience and understand the dynamic biological and psychological processes they encounter throughout adolescence are integral in determining how they define themselves in relation to others, and in shaping their own perceptions of how they exist within their adolescent sexual worlds.

## Social Ecological Perspectives on Adolescent Sexual Socialization

People develop while embedded in and interacting with and within multiple contexts across levels of society. Adolescents, their social environments, the interactivity and the processes that connect them, comprise the social ecologies for adolescent development. Ecological approaches to human development describe the ways in which people change and stay the same within the contexts of their social and built environments. According to this framework, human development takes place via proximal, complex, and reciprocal interaction processes between an individual human being and the people, objects, and symbols present in their immediate environment. The impact of these proximal processes on human development is determined by three major dynamics: a) an individual's characteristics, b) an individual's proximal and distal social and physical environment, and c) the nature of the developmental outcomes of interest (Bronfenbrenner, 1994). Social ecological frameworks describe how individuals are socialized and act as both agents and subjects within their social environments via bidirectional interactions and processes that take place over time.

Bronfenbrenner (1994) describes five major levels comprising the social environment of human development: (1) microsystems, (2) mesosystems, (3) exosystems, (4) macrosystems, and (5) chronosystems. According to Bronfenbrenner & Morris (2006), microsystems are the patterned activities, social roles, and interpersonal relations most immediate to the developing person. Mesosystems are the connections and interactions a developing person has with settings in which they are situated. Adolescent exosystems (e.g., neighborhoods, faith-based institutions) are made up of the linkages and processes that take place between two or more settings – one of which does not contain the adolescent, but still indirectly influences processes that take place within settings proximal to the individual adolescent's development. Macrosystems consist of the

overarching configuration of the micro-, meso-, and exosystems that make up a given culture or society, including the belief systems, bodies of knowledge, resources, customs, lifestyles, opportunity structures, hazards, and life course options that are embedded in broader systems (Bronfenbrenner, 1994). The fifth level – chronosystems –refers to either change or consistency perpetuated over time – either across the life course of a developing person, or within the dynamics of the environment in which people are situated.

Only considering the systems in which individuals are embedded is insufficient for truly understanding the nature and course of sexual development. Developmental perspectives emphasize two other major domains of influence over sexual development embodied within an individual – biological and psychological processes. To account for these very important and influential domains, Bronfenbrenner later expanded the social ecological model to depict "the dynamic, developmental relations between an active individual and his or her complex, integrated and changing ecology" (Bronfenbrenner, 2005, p. xviii). Bronfenbrenner's resultant bioecological theory constitutes a process-person-context-time (PPCT) model for theorizing an integrated, ecological system forming the landscape of human development – in context and over the life course. Elaborating the defining properties of the bioecological model, Bronfenbrenner and Morris suggest, "human development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects and symbols in its immediate external environment" (2006, p. 797). These interactions, they note, must take place on a regular basis and over extended periods of time to be effective in driving or shaping human development. The second defining property asserts, "the form, power, content, and direction of the proximal processes (PROCESS) effecting development vary systematically as a joint function of the characteristics of the developing

person (PERSON) and their environment – both proximate and remote (CONTEXT) – in which the processes are taking place, the nature of the developmental outcomes under consideration, and the social continuities and discontinuities and changes occurring over time (TIME) through the life course and the historical period during which the person lived" (p. 798).

A bioecological perspective juxtaposes intrapersonal dynamics as co-occurring alongside interpersonal processes, parceling out the multiple levels of social influence during adolescent sexual development, from the most immediate/proximal (i.e. family and peer socialization) to more remote/distal (e.g., institutions, policies, cultural norms) sources of sexual socialization. During adolescence when youth are developing sexually, microsystems –the most immediate and proximal level of social influence– still comprise the most influential contexts for development, especially as it pertains to sexual socialization. Major contexts within adolescent microsystems include their family, peer networks and school socialization. The family – primarily parents, but also including siblings and extended family networks – comprises the most influential source of socialization for overall development from childhood (Maccoby, 1992), across adolescence, and through the transition into early adulthood. The role of parents in the sexual socialization of youth varies over the course of adolescence (Fisher, 1986). Three major considerations determine and clarify the roles of parents on adolescent sexual development – overall adolescent development, parental influence on adolescent behavior, and parents' and adolescents' preferences regarding sexual socialization (Shtarkshall, Santelli, & Hirsch, 2007).

There are many commonly held conventions and associations found in research that describe the nature and importance of peer relationships (Brown & Larson, 2009) – two of which have significant implications for adolescent sexual socialization. First, we know that peer relations are more salient in adolescence than in early childhood. The authors note that young

people spend more time – and more often unmonitored time – with age mates during adolescence. Second, Brown and Larson note peer relations often become more complex in adolescence, and in particular, due to the emergence of romantic relationships and friendship groups. Peer networks, platonic same- and cross-sex relationships, "friends with benefits," romantic partner relationships, and other relations often materialize during adolescence (Connolly & McIsaac, 2009), and can all serve as sources of sexual socialization for youth.

Schools function as hubs that enable both formal education, and also socialization for adolescents (Shtarkshall, Santelli, & Hirsch, 2007). From early childhood through adolescence and early adulthood, young people in the U.S. engage in formal (compulsory) and informal learning and socialization facilitated by educational institutions inside and outside of school time and facilities. Socialization in school settings is an intentional, structured, and often, compulsory process to impart knowledge and skills that influence individual development. In schools, adolescents learn directly from teachers and staff based on formal curriculum and standards that vary by state (Common Core Standards Initiative, 2014). While health education seems to be a nationwide priority, sex and sexuality education is severely lacking in comparison. As of 2016, only 24 states and the District of Columbia require public schools to teach sex education (Guttmacher Institute, 2016). While topics covered in school-based sex education programs vary - ranging from contraception, family planning, sexual orientation, and healthy sexual communication and decision-making and other topics - most states emphasize the importance of abstinence from sexual activity in health and sex education.

Neighborhoods and communities often serve as the settings for adolescents, and also their families and peers to develop, work, play, attend school, and interact with networks of social support (Viner, et al., 2012); neighborhood contexts contain settings that both directly (e.g.,

family and peer networks, schools) and indirectly (e.g., parent's workplaces) influence adolescent development, and studies have shown neighborhood characteristics to be linked to adolescent sexual behavior. At the macro-level, national social and economic structures affect and constrain the way in which family, school, peer, and other social contextual factors affect young people's health and development (Viner, et al., 2012). In particular, a society's "super structure," or ideology-producing institutions (Lull, 2011), promulgate a set of normative values, beliefs, ideas and ideals that function to reflect, and also reinforce, the dominant hegemonic structure of a culture. Hegemony is "the power or dominance that one social group holds over others" (p. 33), determining how power is distributed, gained and maintained in a society. Hegemonic structure (e.g., racism, sexism, classism) encompasses and reinforces the dominant ideologies in a society. Dominant ideologies (e.g., White supremacy, patriarchy, heteronormativity, capitalism) are perpetuated through socializing institutions, constructing and reifying the ways in which social power is transacted within hierarchically stratified systems.

## Media Effects and Adolescent Sexual Socialization

Media is the vehicle through which a shared set of meanings are produced, exchanged, and circulated within a cultural group or across society (Hall S. , 1997). Media functions as one of the primary means of mass communication and the representation of meanings, symbols, values, language and culture. Hall defines media representations as the ways in which various media portray particular groups, communities, experiences, ideas or topics from a particular ideological or value-based perspective. Adolescents exist in a world in which they are immersed in media, enabling them to receive messages, information and mediated representations of the how the world works. Furthermore, due to the advent of advanced technologies, youth are privy

to opportunities to engage media messages via digitally mediated communication and media use. Through advertising, news, entertainment, social networking, and other types of media, adolescents receive health-related media messages on topics, ranging from violence, nutrition, substance use, and (as emphasized in this paper) sexuality (Brown & Witherspoon, 2002). By engaging sexy media, adolescents can seek, discover, and consume sexual media messages and representations, and construct meaning about sex, their own sexuality, and that of the greater society.

Up until the turn of the century, media research primarily focused on and linked use to conventional media (e.g., television/movies, rock music and music videos, advertising, video games, computer and Internet use) to increased violent and aggressive behavior, increased high-risk behavior (e.g., alcohol and substance use), and early onset of sexual activity (Villani, 2001). While newspaper and radio broadcasting were the dominant forms of mass media in the early 1900s, the 1950s ushered in the emergence of home television sets (Singer & Singer, 2001). Television is a medium of socialization for most people on the standardized roles and behaviors in society. However, in recent years, the content, mode of delivery, and interfaces of media targeting youth has also become increasingly specialized (Biocca, 2000; Brown J. D., 2000).

While media has traditionally served as a context for delivery of "cultural pedagogy" – the education that takes place in various social settings (e.g., schools, communities, families) (Steinberg S. R., 2011), the corporatization of popular youth media over time requires a closer examination of how mediated cultural curriculum affects identity formation and knowledge production and legitimation among youth. In cultural pedagogical sites, Steinberg notes, power is organized and deployed, and education and learning are shaped by the social context in which we operate. In American society, youth media corporatization leads to the construction of media

messages, information and representations that reflect the dominant ideologies that are most profitable and rewarded in a capitalist society.

Media helps individuals to construct meaning, interpret their environments, and engage in interactions within their social worlds. Cultivation theory posits that exposure to media (e.g., television), over time, subtly cultivates viewers' perceptions of reality (Gerbner, Gross, Morgan, & Signorielli, 1986). Media messages and imagery (i.e., sexy media) targeting youth function as a primer by providing "sexual scripts" or cognitive schemas to signify sexual situations (Simon & Gagnon, 1973). Sexual conduct is a function of sexual scripts that involve interactions between person(s) and context. Through these and other types of social scripts, media also exposes its users to hegemonic values of dominant ideologies (e.g., White supremacy, patriarchy, capitalism, heteronormativity, Judeo-Christian beliefs, etc.) that shape and reinforce the hierarchical, stratified society in which we live. Insights from media dependency theory help us to recognize linkages between the audience viewing media, the media content itself, and how both are connected to larger social systems (Ball-Rokeach & DeFleur, 1976). When pertinent and relevant information is scarce or inaccessible for an individual, then gaining access to greater society and information to make meaning of it is facilitated through the use, consumption and interaction with media.

Social action theory advances the understanding of how media audiences actively engage media imagery and messages – not only as passive consumers, but also through active participatory engagement via mediated communication. According to social action theory, there are three mechanisms through which meaning arises from media use: 1) the intentions of the producer, (2) the conventions of the content, and (3) the interpretations of the receiving audience (Anderson & Meyer, 1988). A person's age, disposition, prior experience, mood, ideology, social

influences, and social identity comprise some of the factors that determine the types of media the person engages, including content, genre, and use of media technology. Brown (2000) describes a model for adolescents' "media diets" and practices, emphasizing how media types and user engagement can be classified based on two dimensions. The *interaction* dimension refers to the situation of media use along a continuum, ranging from passive to interactive understanding and engagement with media content. The *application* dimension refers to media effects, or the ways that youth interpret, evaluate, and incorporate what they see into their developing sense of self. Individuals who identify with a set of social values and beliefs (i.e., a shared group or communal identity) will have certain preferred media outlets and will select content that reflects and shares the values of the social identity group.

In regard to media and social identity, the *reinforcing spirals approach* suggests that individuals select and use media in a manner that is consistent with a particular social identity. Consequently, the consumption of those media selections increases the salience of that social identity, influencing the individual's assessments and decisions made within the social world (Slater, 2007). During adolescence, youth turn to media in order to develop and clarify their sexual identities, experiences and social situations within the world. As the need grows for information and new representations of their actual and possible sexual selves, media becomes a particularly useful source of sexual socialization. Throughout adolescence and over the life course, youth evolve in regard to their sexuality and sexual identities, which shapes the media selections that they choose to consume and engage. Said plainly, adolescents, their sexual selves, and their selection of and engagement with sexy media are mutually reinforcing over time.

The older adolescents get, the more they rely on media to get information about sex (Bleakley, Hennessy, Fishbein, & Jordan, 2009). Adolescents become less reliant on familial

influences than they were during early childhood as they become more autonomous and independent in preparation for young adulthood. As parental monitoring and control over information seeking processes, media selection and use wanes, media emerges as a powerful and influential source of information for self-socialization – particularly for topics and issues that are under-emphasized, avoided or ignored by parents, schools, or other adult sources of influence. Adolescents who use media for self-socialization purposes draw content from media that influences their views, beliefs, and behaviors in the world in which they live (Arnett, 1995). Media enables a self-socialization process that results from adolescents' relative control over media choices in comparison to other sources of socialization from family, school, community, and other settings. Additionally, media messages are less consistent with the messages conveyed in other contexts, enabling exposure to a greater variety of representations of youth's actual and possible sexual selves.

In recent years, there has been a resurgence of studies deploying the uses and gratification theoretical approach, examining utility of media for its consumers, and the gratifications and benefits associated with media use (Ruggiero, 2000). Adolescents and teens, while seeking and consuming information to support their curiosities and development, use media to satisfy various needs, including the following: (1) diversion, or pleasure-seeking (e.g., (entertainment); (2) cognition, or information-seeking (e.g., news); (3) social utility (e.g., social networking); (4) withdrawal, or establishing barriers between the self and others; and (5) personal identity (e.g., virtual reality, role exploration) (Roberts, Henriksen, & Foehr, 2009). Media dependency theory expands upon uses and gratifications perspectives, highlighting how an audience's dependence on media stems from their limitations and constraints on real-life learning, and their need for more information to achieve life goals (Ball-Rokeach & DeFleur,

1976). The uses, meaning, and resultant gratifications afforded to youth by media are essential for understanding the role that media plays in their socialization and development.

## Bioecological Framework for Adolescent Media Sexual Socialization

Most integrated models of adolescent sexual development focus on the social influence of the nested contexts in which adolescents develop. For example, Kotchick, Shaffer, and Forehand (2001) conceived a multi-systems model that suggested adolescent "self-systems" are influenced primarily by familial (e.g., parents, siblings) and extra-familial systems (e.g., peer networks, teachers); the parts of the self-system, in turn, influence if and how adolescents engage in risky sex behaviors. Socio-cultural (e.g., media), economic, and political systems function as the backdrop to the more proximal contextual processes impacting the lives of youth. Similarly, Lerner's integrated developmental systems of adolescence model embedded adolescents and their parents/family systems within broader social network of relations, and further within the context of even broader communities, society, cultural influences and the natural environment (Lerner & Castellino, 2002).

To fully understand the complexity of adolescent sexual socialization though, including the unique and evolving role of media, an integrated model is needed that comprehensively reflects both the ecologically-influenced and developmentally-driven nature of adolescent sexual development. Few scholars have created integrated models for adolescent development that clarify the role of media. Developmentalists have conceptualized and tested integrated models of behavior change (e.g., theory of reasoned action, theory of planned behavior, integrated behavioral model) (Glanz, Rimer, & Viswanath, 2008), each of which are primarily concerned with how attitudes, perceived norms and personal agency shape – in the context of

environmental constraints – the individuals' intentions to engage in target behaviors. However, in each of the models, media use is posed as a moderating factor, extraneous to the attitudes, norms, personality and intentions of individuals. Furthermore, in the models, socialization (i.e., knowledge and skills to perform behaviors) is consequential to these concepts, and is modeled as having direct impact on behavior.

Research on adolescent media practices and patterns of use has begun to broach the topic of media-in-context. Steele (1999) attempts to expand and refine the Adolescents' Media Practice Model – which demonstrates how adolescents identify, select, interact, and apply media in their lived experience – by suggesting that families, friends, school contexts influence the role that media plays in shaping adolescents' values, attitudes, and beliefs about sex. Ward's (2003) model of the media's contribution to sexual socialization suggests that past/present media diets, viewer involvement and processing, and the sexual messages received from other sources (e.g., parents, peers) affect the sexual attitudes and beliefs, self-concept, decision-making, and behaviors of youth. While these factors are associated with attributes both "upstream" (e.g., media use, exposure and consumption) and "downstream" (e.g., sexual activity, risky sex), they do not represent the breadth of processes involved in media socialization. Ward (2003) described a more comprehensive conceptual model of media sexual socialization, postulating entertainment media's contribution to sexual socialization through the following components: (1) past/present media diet, (2) past/present viewer involvement and processing of sexual content, (3) demographics and viewer characteristics, (4) attitudes and beliefs about sex and sexual relationships, (5) type and prevalence of sexual messages and values received from other sources, (6) other biopsychosocial influences, (7) sex behaviors and sexual decision-making, and (8) sexual self-concept.

While Ward's model addresses the multidimensional nature of media sexual socialization for adolescents in the context of other socializing agents, it does not account for the dynamic nature and variable intensity of media's salience as socializer, across the course of adolescence. Further, it does not account for the additional socializing processes that adolescents engage in, which are facilitated by digital and social media. Still, in each of these models, adolescent media use is primarily conceptualized in terms of media selection, exposure, viewing, and consumption. Cross-disciplinary insights and a multi-systems perspective can inform a more comprehensive and contextually-grounded framework for understanding the role of media in the sexual socialization of adolescents.

The bioecological framework for adolescent media sexual socialization (BFAMSS)[2] weaves together these cross-disciplinary insights and describes how media operates and functions as a sexual socializer during adolescence via the following three propositions, as depicted in *Figure 1*.

1. By means of both conventional (e.g., radio, videos, television, magazines and other print media) and newer media forms (e.g., digital, social, and online), media are a salient and direct source of information, (re)presentations, imagery, and scripts that contributes significantly to the sexual socialization and behavior of adolescents as they transition from childhood to early adulthood.

Mass media are an important context for adolescent sexual socialization and development, and is significantly correlated with youth intentions to have sex, and youth engagement in light to heavy sex behaviors (L'Engle, Brown, & Kenneavy, 2006). The mass media targeted at, and

[2] For more on the bioecological framework for adolescent sexual media socialization, including a more extensive review of theoretical perspectives and the literature, see (Bethune, 2016).

consumed by adolescents abound with suggestive and explicit sexual references (Callister, Stern, Coyne, Robinson, & Bennion, 2011; Hall, West, & Hill, 2012; Ybarra & Mitchell, 2005) and on few occasions, responsible messages that actually promote safe sex, abstinence and sex-related health risks (Collins, Elliott, Berry, Kanouse, & Hunter, 2003; Ward, Day, & Epstein, 2006). All of these can affect how youth understand, process and apply information about sex. Further, as contemporary youth are born into digitally-mediated social worlds, media emerges as an even more salient source of socialization – one that cross-cuts multiple levels of society, infiltrates many youth contexts, and remains a primary influencer across early, middle and late adolescence, and over the life course.

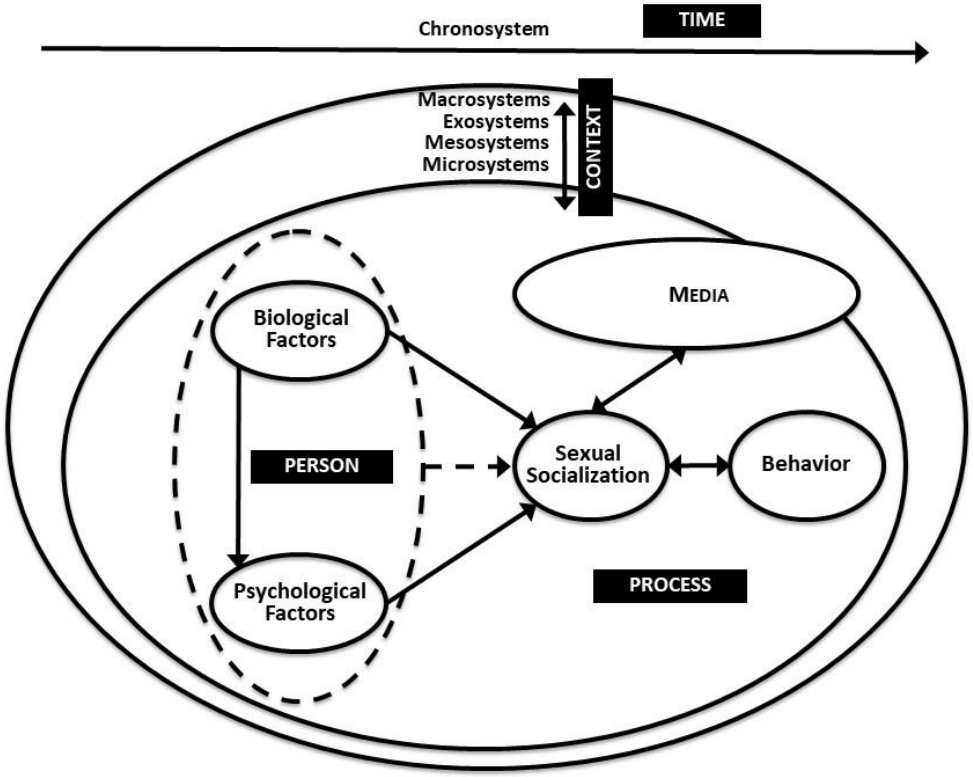


*Figure 1.* Bioecological Framework for Adolescent Media Sexual Socialization

The next proposition lays out how, during adolescence, complex and dynamic changes foreground sexual socialization and development.

> 2. In the context of biological and psychological developmental processes, and other intervening social influences that change in significance, media use is variably influential on sexual socialization across adolescence.

Puberty is widely understood to be an indication of the commencement of adolescence. It brings about sweeping biological changes – for example, the growth and development of primary and secondary sex organs and hormonal activation – that drive physical development towards physical maturation. In tandem, psychological processes take place that increase adolescents' cognitive and emotional capacity, impacting their ability to understand and engage in sex. During this time, youth are sexually socialized within their social networks, and in family and school settings. Parents, peers, and teachers are primary socializers in regard to sexual development. However, as youth grow and develop, older adolescents begin to rely more on media as a source of information, shaping their beliefs about sex (Bleakley, Hennessy, Fishbein, & Jordan, 2008).

> 3. Adolescents are not passive recipients of media. During adolescence, individuals develop the capacity and ability to directly, actively and critically engage media for sexual socialization – and can do so, as producers, consumers, and also sharers of media.

As adolescents gain the psychological capacity to perceive and understand more of the world, and as the need for information grows, media emerge as a useful, accessible, and effective sources of socialization. Media – and especially digital and social media – enable adolescents to select, critically review, and directly engage information about sex (Brown J. D., 2000), in ways

that engenders self-socialization (Arnett, 1995). Advanced digital technologies and social media platforms now have features and functionality that allow adolescents to produce media content, consume and use media information and share content broadly (or discretely) within their social networks.

Media comprise a construct that is centered in the BFAMSS framework, and other sources of influence are considered as context to direct effects of media. Second, the framework considers the notion that adolescence is a period of life that spans many years during which many developmental milestones are achieved. With this in mind, the framework presupposes that media, as a social influencer, may sustain, diminish, vacillate – or what's more probable, crescendo – throughout the course of adolescence, and does so in tandem, as other influences vary. Last, the framework provides latitude for exploring new modes of socialization – including those facilitated by digital and social media use and engagement – and models the cross-cutting effect of media in contexts spanning multiple levels of social organization. The propositions of the BFAMSS framework broadly inform the forthcoming analyses presented in this dissertation. The framework places the relationship between media, sexual socialization, and behavior within a broader socialization landscape that is gendered, raced, and classed – shaped by the structural influences. I focus on conventional mass media and its role in adolescent sexual development, as race, gender, socioeconomic status, sexuality and their intersections are considered.

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# CHAPTER 3

## Examining the Relationship Between Media Use and Sexual Socialization Across Adolescent Development

### Introduction

In adolescence, youth experience puberty and brain development that influences their behaviors and capacities that facilitate transitions in the domains of family, peers, education, and in health behaviors. Biological, psychological, and social factors – including socialization – all influence adolescent health, development and behaviors, as they transition from childhood through adolescence into early adulthood (Office of Disease Prevention and Health Promotion, 2015). In general, socialization refers to "the way in which individuals are assisted in becoming members of one or more social groups" (Grusec & Hastings, 2007, p. 1). Adolescent socialization is the set of processes that help youth acquire the skills necessary to function as competent and successful members of social groups, culture and society (Smetana, Robinson, & Rote, 2014).

During adolescent development, media emerge as primary sources of sexual socialization, alongside other social influences, such as parents, peers, and teachers. Many studies have described the link between the use of media (i.e., television, radio, video, print media, Internet) and youth sexual attitudes, intentions, behaviors, and health statuses (Brown & L'Engle, 2009; Collins, et al., 2004; L'Engle & Jackson, 2008; Pardun, L'Engle, & Brown, 2005; Strasburger, Jordan, & Donnerstein, 2010; Wingood, et al., 2003). Little is known though about media's enduring role in sexual socialization as youth move across adolescence. While some studies examine media's influence on sex-related outcomes in youth and young adults, few

studies use longitudinal study designs that look at the role of media in sexual socialization across a broad age range; those that attempt to do so rely heavily on cross-sectional research designs (Ward, 2003).

Drawing on the bioecological framework for adolescent media sexual socialization (BFAMSS) and using data from the National Longitudinal Study of Adolescent Health (Add Health), this study examines the influence of media use on sexual socialization across adolescence. Through media and other sources of socialization, youth receive images, messages and representations about their social worlds. As youth are embedded in the hegemonic context of greater society along social divisions by race, gender, and class, I hypothesize that youth's experiences with sexual socialization reflect this dynamic in a manner that are gendered, racialized, and classed.

To reflect and explore these dynamics, I ask the following set of research questions:

1. Does media use in early adolescence predict sexual socialization later in adolescence?
2. Does media use in early adolescence predict sexual socialization later in adolescence, when race/ethnicity, socioeconomic status, and gender are also considered?

Add Health data and multiple linear regression analysis are used in order to examine these relationships. Then policy, practice, and research implications of my findings are discussed.

## Literature Review

Adolescence commonly refers to the developmental period marked by the transition from childhood to adulthood, and typically starts with the onset of puberty – a period between approximately 10 to 19 years of age when individuals experience increased cognitive capacity

and undergo physical and social-role maturity (Sawyer, et al., 2012). During adolescence, youth develop sex behaviors that are influenced socially by individual, peer, family, school, community, and societal-level factors (Office of Disease Prevention and Health Promotion, 2015). During adolescence, youth receive messages, signals, and cues about their worlds that are complex, often conflicting, and delivered via multiple developmental and socialization processes and agents. Social contexts - such as families, schools, neighborhoods, and media – are conventional settings for adolescent socialization that can facilitate adolescents learning regarding health and health behaviors via various socialization processes (e.g. rituals, routines, formal education, modeling, etc.). This chapter is concerned with media as a source of socialization, in general, and its relationship to adolescent sexual socialization.

**Media Socialization**

Youth become less reliant on familial influences during adolescence than in early childhood, as they become more autonomous and independent in preparation for young adulthood. As parental monitoring and control over youths' information-seeking processes, media selection and use wanes, media emerge as powerful and influential sources of information for self-socialization – particularly for topics and issues that are under-emphasized, avoided or ignored by parents, schools, or other adult sources of influence. Adolescents who use media for self-socialization purposes draw content from media that influences their views, beliefs, and behaviors in the world in which they live (Arnett, 1995). Media use enables a self-socialization process that results from adolescents' relative control over media choices in comparison to other conventional sources of socialization. Media messages and representations are often less

integrated with the messages conveyed in the other conventional settings or from adult social influences.

In addition to self-socialization, adolescents have various motivations that lead them to seek, consume, and engage media. In recent years, there has been a resurgence in studies deploying the uses and gratification theoretical approach, examining utility of media for its consumers, and the gratifications and benefits associated with media use (Ruggiero, 2000). Adolescents and teens, while seeking and consuming information to support their curiosities and development, use media to satisfy various needs, including the following: (1) diversion, or pleasure-seeking (e.g., (entertainment); (2) cognition, or information-seeking (e.g., news); (3) social utility (e.g., social networking); (4) withdrawal, or establishing barriers between the self and others; and (5) personal identity (e.g., virtual reality, role exploration) (Roberts, Henriksen, & Foehr, 2009). Media dependency theory expands upon uses and gratifications perspectives, highlighting how an audience's dependence on media stems from the limitations and constraints on their real-life learning, and their need for more information to achieve life goals (Ball-Rokeach & DeFleur, 1976). The uses, meaning, and resultant gratifications afforded to youth by media are essential for understanding the role that media use plays in their socialization and development.

Children and adolescents spend an average of over 7 hours per day using media (Strasburger, Jordan, & Donnerstein, 2010). While television viewing remains the most common platform for mass media broadcasting, other conventional forms of media (e.g., movies, radio, video games) are widely used among school-aged youth. The advent of digital and social media platforms and technology has aided the overall growth of media use over the past decade (Council on Communications and Media, 2016). When media multitasking – using more than

one medium at a time – is considered, then youth consume, on average, an estimated 10 hours and 45 minutes of media content daily (Rideout, Foehr, & Roberts, 2010).

**Sexual Socialization**

Adolescence activates biological (e.g. puberty, sexual maturation) and psycho-socio-emotional processes that form the landscape for youth to navigate their sexual health and development. Adolescents are presented with several opportunities for sexual socialization that enable them to develop sex knowledge, skills, and attitudes, make decisions about sex, and negotiate engagement in sex behaviors. These processes – collectively referred to as sexual socialization – take place in the social contexts in which adolescents acquire sexual knowledge and experiences (Tolman & McClelland, 2011). Through sexual socialization processes, youth develop ideas and expectations about their sexual practices, experiences, health and development. Grusec & Hastings (2007) note that socialization is best understood when other biological and sociocultural factors are also considered, and the ways in which they interact, intertwine, and help shape the complex lives of individuals.

Sexual socialization processes are critical as youth encounter risky sexual situations more frequently during adolescence and throughout early adulthood. In addition to family, school, and community contexts, media emerge as a primary context and social influence in the lives of adolescents, especially as it relates to shaping their sexual attitudes, intentions and behaviors (L'Engle, Brown, & Kenneavy, 2006). For some youth, media function as a "sexual super peer", in comparison to other conventional sources of sexual socialization (Brown, Halpern, & L'Engle, 2005; L'Engle, Brown, & Kenneavy, 2006).

**The Bioecological Framework for Adolescent Media Sexual Socialization**

An integrated framework is needed that comprehensively reflects both the ecological and developmentally-driven nature of adolescent sexual development. The bioecological framework for adolescent media sexual socialization (BFAMSS) weaves together the following: (1) life course perspectives outlining how biological, psychological and social factors contribute to the development of individuals across the life course; (2) social ecological frameworks which help elucidate how human development takes place via reciprocal processes transacted between individuals and within their social environments; and (3) media effects theories that postulate how media is both a context and conduit of sexual socialization. Taken together, these insights make up the BFAMSS framework, which attempts to describe how media operate and function collectively as a sexual socializer among other sources of socialization during adolescence (Bethune, 2016). The framework, depicted in *Figure 2*, includes several propositions – the first of which informs the current analyses.

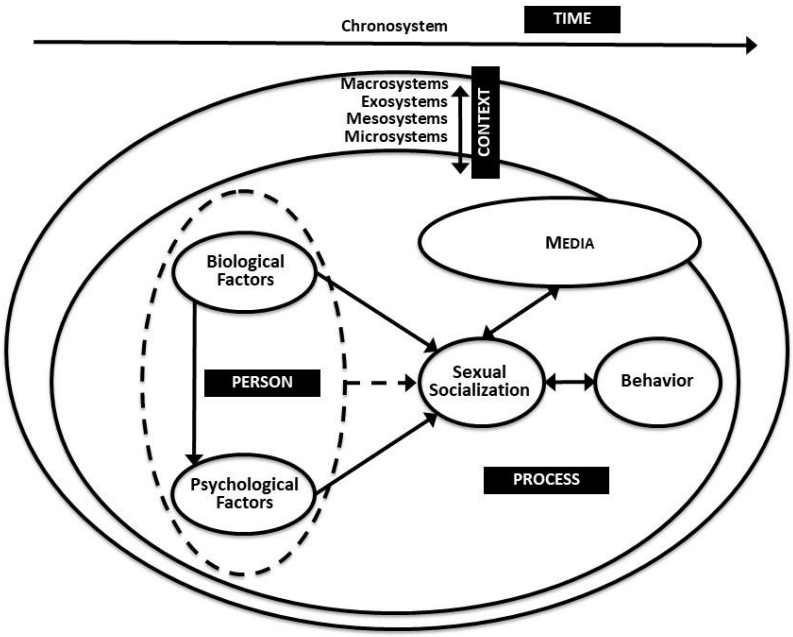


*Figure 2*. Bioecological Framework for Adolescent Media Sexual Socialization

Proposition 1 states:

> By means of both conventional (e.g., radio, videos, television, magazines and other print media) and newer media forms (e.g., digital, social, and online), media are a salient and direct source of information, (re)presentations, imagery, and scripts that contributes significantly to the sexual socialization and behavior of adolescents as they transition from childhood to early adulthood.

Here, it is proposed that media convey to adolescents sets of messages, images, and representations that influence what adolescents know, believe, and imagine about sexuality, sex behaviors and other themes that are a part of sexual socialization. Exposure to, and consumption of media – and in particular, sexy media – likely influence what adolescents think and feel about sexuality, relationships, sexual interactions, experiences, behaviors, and development. In the analysis that follows, I explore the relationship between the use to conventional media (e.g. video games, music, television viewing) and multiple dimensions of sexual socialization measured later in adolescence. Next, I share insights from existing literature that explores adolescent media use and sexual socialization.

**Media Effects on Adolescent Sexual Socialization**

Overall, evidence in reviews of literature indicate that exposure to sexually-oriented and explicit media is associated with sexual socialization processes, such as acceptance of stereotypical and casual sexual attitudes, higher perceptions and expectations of sexual activity (Ward, 2003); less progressive gender role attitudes, and for boys, more permissive sexual norms and sexual harassment perpetuation (Brown & L'Engle, 2009). Throughout the literature, studies support these claims by quantitatively examining how exposure to sexy media is associated with

risky sex attitudes and behaviors in adolescents and young adults. In one study involving 266 undergraduate college students, exposure to more sexually explicit lyrics in music videos is linked to the presence of more permissive attitudes toward premarital sex and stronger endorsement of sexual double standards (e.g. different beliefs about sexual preferences and behaviors of others, based on gender) among young people (Zhang, Miller, & Harrison, 2008). In another study involving nationwide sample of 1,228 participants, sexy media exposure (e.g., sexy media content in movies) during adolescence is linked to subsequent sex risk engagement and behavior, partially explained by sensation-seeking (O'Hara, Gibbons, Gerrard, Li, & Sargent, 2012). In a study involving 1011 middle school-aged adolescents, media use explains 13% of the variance in intentions to have sex; media use has more of an influence than religious and school contexts.

During adolescence, youth develop the capacity and ability to actively engage media that targets, or that is made available to youth. Adolescents often actively select and use media that contains sexual content to drive their own self-sexual socialization. Active adolescent media audiences, according to the uses and gratifications paradigm, select specific media and use it to satisfy their needs, interests, and preferences for information, imagery, and entertainment. In one study, half of a nationally-representative sample of 810 adolescents report actively seeking sexual content in their media sources. Youth who ultimately report seeking sexy media content are also more likely to have had intentions to do so in the first place, and, as a result of perceived normative pressure, to actually seek sexy content (Bleakley, Hennessy, & Fishbein, 2011).

Studies examining the sexual socialization messages in entertainment mass media show that, across many media genres and types, media that targets, or that is preferred and consumed by adolescents, often contains substantial amounts of sexy content (Wright, 2009). A study on

3,261 7th to 8th grade adolescents shows that, overall, 11% of the media consumed by the surveyed participants contained sexy content (Pardun, L'Engle, & Brown, 2005). With the average adolescent being exposed to thousands of impressions featuring sexual content per year, research examining media use patterns and various types of sexual socialization can be helpful for understanding media's role in adolescent sexual socialization. The current study aims to explore media use, in general, and its influence on sexual socialization later in adolescence.

## Methods

This study used data from the National Longitudinal Study of Adolescent Health (Add Health)[3]. Add Health is the largest and most comprehensive survey of adolescents undertaken in the United States. The study began in 1994 with the in-school questionnaire, administered to a group of over 90,000 middle- and high-schoolers from a sample of 80 high schools and 52 middle schools from across the US. selected with non-random probability of selection. The incorporation of systematic sampling methods and implicit stratification into the Add Health study design ensured that this sample is representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. Of the students from those schools, a portion were selected to participate in an in-home interview during the same time period (1994-1995). Wave 1 consisted of the in-school and in-home questionnaires, vocabulary data, spatial data, school administrator responses and a parent questionnaire, and was followed up by three data collection periods to date: Wave 2, 1996; Wave 3, 2001; and Wave 4, 2008 (Harris, et al.,

[3] This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis.

2009). A 50% sample of Wave 1 in-home questionnaire data was available for public use, along with responses in Waves 2, 3, and 4 from retained participants that were included in the original public use dataset.

**Procedures**

Publicly-available data from the Wave 1 and 2 questionnaires and in-home interviews of the Add Health study were used in this analysis. Wave 1 data (N=6,504) were collected in the U.S. from 1994 – 1995 from a sample of adolescents in grades 7 through 12. Wave 2 data (N=4,834) were collected through follow-up interviews that took place from April through August 1996 (Harris, et al., 2009). Institutional review board procedures were conducted for the larger Add Health study prior to data collection. The Institutional Review Board at Vanderbilt University was consulted for supplemental review for the purposes of this dissertation research; the application for review exemption was submitted and approved.

Participants who provided complete data for all of the key predictor, outcome and control variables central in this study were included in the analysis. Of the 6,504 participants from Wave 1, 4,834 participants also provided data at Wave 2. While almost all participants (n=6,503) provided race and gender data at Wave 1, and while most participants provided valid Wave 1 data for media use (n=6,457) and computed socioeconomic status (n=5,641), several participants were excluded from analysis due to insufficient data (e.g., less than 75% complete data for each scale) for sexual socialization measures at either Wave 1 or 2. Only 4,051 (62%) of 6,504 participants provided sufficient data at Wave 1 (e.g., at least 75% complete data for each scale) for all sexual socialization scales. At Wave 2, only 2,943 (61%) of 4,834 participants provided

sufficient data for the scales. A total of 1,971 participants met all of the inclusion criteria for both waves.

Experiencing sexual abuse – like other forms of child abuse – can have dire consequences in the form of psychological and behavior disturbances across development (Collin-Vezina, Daigneault, & Hebert, 2013). Of those participants who initially met inclusion criteria (n=1,971), 166 (8.4%) participants reported having experienced forced or coerced sex at Waves 1 or 2, and were therefore excluded from this analysis. Victims of childhood sexual abuse need more nuanced analysis performed for future research, in order to address this complexity.

**Demographic Characteristics**

Demographic characteristics included participants' gender and race; parental education, household income, and age (in years) at the time of the Wave 1 in-home interview. Table 1 shows the demographic characteristics of participants in the sample used in this analysis. Attrition analysis was performed using chi-square analyses and t-tests in order to highlight key differences between participants included in and excluded from this analysis. The chi-square test of independence was used as a test of independence between two categorical variables – in this case, the independence of inclusion/exclusion in the analysis from race and gender. The independent t-test was used to determine whether there was a statistically significant difference in the average parental education, age, and household income between those included and excluded from analyses.

Results from a chi-square analyses indicated that the participants included in this analysis did differ from those excluded by gender, $X^2(1, 6{,}503)\ 34.13$, $p<.01$. Participants included also differed by race from those excluded, $X^2(5, 6{,}504)\ 52.00$, $p<.01$. Males (32%) were more likely

than females (25%), and White participants (31%) were more likely than other races (19-29%) to be included in analyses. Independent samples t-tests were conducted to compare highest reported parental education (standardized z-score based on categories), household income (in thousands of dollars), age (in years) at Wave 1 in-home interview, respectively, for included and excluded participants. There was a significant difference in the highest reported parental education of those included (M=.06, *SD*=.98) and excluded (M=-.03, *SD*=1.01), $t(5,611) = 3.25$, $p = .011$.

Table 1
*Demographic Characteristics, N=1,855*

| Variable | % (n) or Mean (*SD*) |
|---|---|
| Race/Ethnicity | |
| White | 64.0 (1,188) |
| Black/African American | 21.5 (398) |
| American Indian/Native American | 0.9 (17) |
| Asian or Pacific Islander | 2.4 (24) |
| Hispanic/Latino | 11.2 (208) |
| Gender | |
| Female | 45.9 (851) |
| Male | 54.1 (1,004) |
| Highest Parental Education | |
| 8th grade or less | 3.3 (61) |
| More than 8th grade; did not graduate HS | 5.8 (107) |
| Business/trade/vocational school, instead of HS | 0.6 (11) |
| HS graduate | 19.7 (366) |
| Completed GED | 4.0 (75) |
| Business/trade/vocational school after HS | 9.0 (167) |
| Some college, did not graduate | 22.0 (409) |
| Graduated, 4-year degree | 19.0 (353) |
| Training beyond 4-year degree | 16.5 (306) |
| Age at Wave 1 (in years) | 16.6 *(1.0)* |
| Household Income (in thousands of dollars) | 50.7 *(65.8)* |

There was also a significant difference in the household income of those included (M=50.74, *SD*=65.85) and excluded (M=45.87, *SD*=49.68), $t(4,927) = 2.94$, $p < .01$. On average, participants included had slightly higher levels of parental education (i.e., median parental education for both included/excluded participants is "some college") and higher household annual income (~$5,000 more income) than those excluded. Finally, there was a significant difference in the age at Wave 1 interview of included (M=16.59, *SD*=.97) and excluded (M=15.81, *SD*=1.95), $t(6499) = 15.19$, $p < .01$, due in part to the age restrictions on questions related to sex.

In comparison to participants who were excluded based on pre-determined criteria, participants who were included were more likely to be White, male, older, and have higher reported parental education and household income. Study documentation from the larger Add Health study notes that for some of the variables of interest (i.e. sexual socialization variables) in the current analysis, participants were not asked the questions if they were under the age of 15, resulting in missing data, and therefore, exclusion of those cases from this analysis.

**Independent Variables**

In this analysis, race, gender, socioeconomic status, and media use were the main predictor variables. Below is a description of how these factors were measured and operationalized for analysis. Table 2 contains more detailed information about each of the independent variables.

**Race.** *Race* (reported in Table 1) was computed using Wave 1 and 2 (discrepancies corrected) race and ethnicity data. Six dummy variables (1= "Yes"; 0= "No") indicated whether participants reported that they were (1) White, (2) Black or African American (Black), (3) American Indian or Native American (AINA), (4) Asian or Pacific Islander (API), or (5)

Hispanic. For participants who reported multiple races and/or Hispanic ethnicity, the *race* category designated was assigned according to the following prioritized order ranking: 1) Hispanic, 2) Black/African American, 3) AINA, 4) API, 5) White, and 6) Other, in accordance with conventions recommended in Add Health study documentation.

**Gender.** Gender (reported in Table 1) was computed using Wave 1 and 2 (discrepancies corrected) self-reported biological sex. For *gender*, 1= "female"; 0= "male".

**Socioeconomic status.** Many studies have highlighted the difficulty and challenge of defining and measuring socioeconomic status (SES) for adolescent health research. While some research suggests that economic factors are most strongly correlated with subsequent health (Duncan, Daly, McDonough, & Williams, 2002), other research emphasizes that socioeconomic factors - such as education and income - are not interchangeable, and therefore, no single measure is a best representative proxy for SES (Braveman, et al., 2005). Often, current income and education - which are found to frequently correlated with health outcomes in health disparities and adolescent health research – along with other sociodemographic factors are used concurrently, or in composite measures using both social and economic indicators to reflect a socioeconomic gradient (Shavers, 2007; Goodman, 1999; Bradley & Corwyn, 2002; Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010).

To measure SES in this analysis, parent reports of education and household income were used from the Wave 1 in-home questionnaire. For each respondent, the highest level of education was reported for each of up to two parents. Similar to conventions used in previous Add Health studies, these data were re-coded to ordinal values, ranging from 1= "$8^{th}$ grade or less" to 8= "training beyond a 4-year degree" (see Table 1 for demographic breakdown). Then, the highest level of parental education between the two parents was computed, then standardized using the

z-score, yielding *parental education*. For each participant, the total household income, in thousands of dollars, was reported by a parent (see Table 1). To address the nonnormality (i.e., positive skewedness) of the reported household income data, the natural log of this value was computed; this value was then standardized using the z-score, resulting in *household income.* *Parental education* and *household income,* were averaged, yielding a composite scale, *socioeconomic status (SES).*

**Media use at Wave 1.** To measure overall media use at Wave 1, I computed the total weekly hours media were used, using the sum of 4 in-home questionnaire items from Wave 1, which represent the self-reported number of hours different conventional types of media were used each week (i.e., television, videos, video/computer games, radio) (see Table 2). To address the nonnormality (i.e., positive skewedness) of the reported media use data, the natural log of this sum was computed, resulting in *media use* at Wave 1.

**Dependent Variable – Sexual Socialization at Wave 2**

For this analysis, sexual socialization at Wave 2 was the outcome variable of interest. Therefore, I used five measures of sexual socialization, using self-report data from the Wave 2 in-home questionnaire - *sex knowledge, perceptions of sex risk, beliefs about pregnancy, perceived birth control efficacy,* and *beliefs about birth control*. Table 3 contains more information about each of the dependent variables. Scores were calculated for participants with at least 75% valid data for each measure. For the *sex knowledge* composite scale, the 10 items were answered either true or false, with one of the answers being correct, and the other being incorrect. These variables each were re-coded such that 1= “correct” and 0= “not correct”, then averaged. For *perceptions of sex risk* composite scale, two items were each reverse-coded, so

that higher values indicate higher perceived risk, then averaged together. For *beliefs about pregnancy* composite scale, two items were used – one of which was reverse-coded – then averaged together so that higher values for each reflected more casual or liberal views about how pregnancy might impact the lives of participants. For *perceived birth control efficacy,* three items were each reverse-coded, then averaged together so that higher values indicate higher assessments of birth control self-efficacy. For the *myths about birth control* composite scale, eight items were used – one of which was reverse re-coded – then averaged together so that higher values for each item reflect rejection of birth control myths. Table 2 shows more detailed information on the dependent variables.

## Control Variables

The statistically controlled variables used in this analysis included the age of participants at Wave 1, as well as the level of sexual socialization reported at Wave 1 for each of the five measures. Table 1 (for age at Wave 1) and Table 2 (for sexual socialization reported at Wave 1) shows more detailed information on the control variables.

Table 2
*Descriptive Statistics of Dependent and Independent Variables, N=1,855*

| Variable | Description | Metric (after re-coding) | Mean (Wave 2) | *SD* (Wave 2) | Alpha (Wave 2) | Alpha (Wave 1 Control) |
|---|---|---|---|---|---|---|
| SEXUAL SOCIALIZATION | | | | | | |
| *Sex Knowledge* | Average | | 0.65 | *0.16* | *0.32* | *0.34* |
| Item 1 | "When a woman has sexual intercourse, almost all sperm die inside her body after about six hours." | 1= "Correct (False)" 0= "Incorrect (True)" | 0.57 | *0.50* | | |

| | | | | |
|---|---|---|---|---|
| Item 2 | “When using a condom, the man should pull out of the woman right after he has ejaculated or come.” | 1= “Correct (True)” 0= “Incorrect (False)” | 0.74 | *0.44* |
| Item 3 | “Most women's periods are regular, that is, they ovulate (are fertile) fourteen days after their periods begin.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.24 | *0.43* |
| Item 4 | “Natural skin (lamb skin) condoms provide better protection against the AIDS virus than latex condoms.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.83 | *0.38* |
| Item 5 | “When putting on a condom, it is important to have it fit tightly, leaving no space at the tip.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.65 | *0.48* |
| Item 6 | “Vaseline can be used with condoms, and they will work just as well.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.72 | *0.45* |
| Item 7 | “The most likely time for a woman to get pregnant is right before her period starts.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.45 | *0.50* |
| Item 8 | “Even if the man pulls out before he ejaculates (even if ejaculation occurs outside the woman's body), it is still possible for the woman to become pregnant.” | 1= “Correct (True)” 0= “Incorrect (False)” | 0.80 | *0.40* |
| Item 9 | “As long as the condom fits over the tip of the penis, it doesn't matter how far down it is unrolled.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.92 | *0.27* |
| Item 10 | “In general, a woman is most likely to get pregnant if she has sex during her period, as compared with other times of the month.” | 1= “Correct (False)” 0= “Incorrect (True)” | 0.61 | *0.49* |

| | | | | | | |
|---|---|---|---|---|---|---|
| *Perceptions of sex risk* | Average | | 4.17 | *1.83* | *0.85* | *0.83* |
| Item 1 | "What do you think your chances are of getting AIDS?" (reverse-coded) | 1= "no chance" to 5= "very high" | 2.13 | *0.99* | | |
| Item 2 | "What do you think your chances are of getting another sexually transmitted disease, such as gonorrhea or genital herpes?" (reverse-coded) | 1= "no chance" to 5= "very high" | 2.04 | *0.98* | | |
| *Beliefs about pregnancy* | Average | | | | *0.76* | *0.65* |
| Item 1 | "Getting (someone) pregnant at this time in your life is one of the worst things that could happen to you. | 1= "strongly agree" to 5= "strongly disagree" | 1.66 | *1.00* | | |
| Item 2 | It wouldn't be all that bad if you got (someone) pregnant at this time in your life." (reverse-coded) | 1= "strongly disagree" to 5= "strongly agree" | 1.75 | *0.99* | | |
| *Perceived birth control efficacy* | Average | | 11.64 | *2.44* | *0.74* | *0.71* |
| Item 1 | "You are quite knowledgeable about how to use a condom correctly." (reverse coded) | 1= "strongly disagree" to 5= "strongly agree" | 4.23 | *0.83* | | |
| Item 2 | "You are quite knowledgeable about the rhythm method of birth control and when it is a "safe" time during the month for a woman to have sex and not get pregnant." (reverse coded) | 1= "strongly disagree" to 5= "strongly agree" | 3.64 | *1.11* | | |
| Item 3 | "You are quite knowledgeable about the withdrawal method of birth control." (reverse coded) | 1= "strongly disagree" to 5= "strongly agree" | 3.77 | *1.05* | | |
| *Myths about birth control* | Average | | 31.69 | *5.79* | *0.81* | *0.76* |
| Item 1 | "In general, birth control is too much of a hassle to use." | 1= "strongly agree" to 5 = "strongly disagree" | 4.13 | *1.12* | | |

| | | | | |
|---|---|---|---|---|
| Item 2 | "In general, birth control is too expensive to buy." | 1= "strongly agree" to 5 = "strongly disagree" | 3.99 | *1.11* |
| Item 3 | "It takes too much planning ahead of time to have birth control on hand when you're going to have sex." | 1= "strongly agree" to 5 = "strongly disagree" | 4.06 | *1.06* |
| Item 4 | "It {IS/WOULD BE} too hard to get a {GIRL/BOY} to use birth control with you." | 1= "strongly agree" to 5 = "strongly disagree" | 4.05 | *1.02* |
| Item 5 | "For you, using birth control {INTERFERES/ WOULD INTERFERE} with sexual enjoyment." | 1= "strongly agree" to 5 = "strongly disagree" | 3.88 | *1.11* |
| Item 6 | "It {IS/WOULD BE} easy for you to get birth control." (reverse coded) | 1= "strongly disagree" to 5 = "strongly agree" | 3.76 | *1.26* |
| Item 7 | "Using birth control is morally wrong." | 1= "strongly agree" to 5 = "strongly disagree" | 4.18 | *0.99* |
| Item 8 | "If you used birth control, your friends might think that you were looking for sex." | 1= "strongly agree" to 5 = "strongly disagree" | 3.63 | *1.17* |
| MEDIA USE | | | | |
| *Total media use* | Sum | | 40.81 | *31.27* |
| Item 1 | "How many hours a week do you watch television?" | Range 0 to 99 hours | 15.38 | *14.13* |
| Item 2 | "How many hours a week do you watch videos?" | Range 0 to 99 hours | 4.49 | *6.84* |
| Item 3 | "How many hours a week do you play video or computer games?" | Range 0 to 99 hours | 2.66 | *5.95* |
| Item 4 | "How many hours a week do you listen to the radio?" | Range 0 to 99 hours | 18.27 | *20.26* |

**Age at Wave 1.** The *age* (in years) of participants at Wave 1 (see Table 1) was computed using four variables from the Wave 1 in-home questionnaire – self-reported birth month, self-reported birth year, month of in-home interview, and year of in-home interview. The date difference between the birth month/year and interview month/year yields the age at Wave 1. The latest birth month and year data provided across Waves 1 through 4 was assumed to be the most accurate and was used to calculate the age at the Wave 1 in-home interview.

**Sexual socialization at Wave 1.** Data from Wave 1 in-home questionnaires were used to compute all five measures of sexual socialization, in the same manner the composite scales were created for the dependent variables measured at Wave 2.

## Analysis Plan

Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corporation, 2017) was used to perform quantitative statistical analysis. Five multiple linear regression analyses were performed in which five measures of sexual socialization (i.e., *sex knowledge, perceptions of sex risk, beliefs about pregnancy, perceived birth control efficacy, myths about birth control*) were regressed onto media use at Wave 1 at step 1, and then onto race, gender, SES, and controlling for age at Wave 1 and the parallel sexual socialization measure at Wave 1. A multiple linear regression assesses the relationship among a set of dichotomous, or ordinal, or interval/ratio predictor variables on an interval/ criterion variable. In this instance, the independent variable of interest is *total media use*, and other independent variables include *race, socioeconomic status (SES) gender, age* and a dimension of *sexual socialization* at Wave 1. The dependent variable for each analysis was the parallel dimension of sexual socialization - *sex knowledge (SK), sex risk perceptions (SRP), beliefs about pregnancy (BAP), perceived birth*

*control efficacy (PBCE)*, and *myths about birth control (MABC)* – measured at Wave 2. For each measure of sexual socialization, two models are tested: (1) a measure of sexual socialization at Wave 2 is regressed onto *media use* at Wave 1 to test the main effect; and (2) a measure of sexual socialization at Wave 2 was regressed onto *media use*, *race, gender*, *SES*, controlling for *age* at Wave 1 and the parallel measure of *sexual socialization* at Wave 1.

Sequential multiple linear regression—the Enter selection—was used. The Enter selection method is a standard selection method of variable entry that enters all independent variables (predictors) simultaneously into a model at each step. Variables were evaluated by how they contribute to the prediction of the dependent variable in the context of the predictability afforded by the other variables in the model. The *F*-test was used to assess whether the set of independent variables in this analysis collectively predicted the dependent variable (e.g., sexual socialization). *R*-squared—the multiple correlation coefficient of determination—was used to determine how much variance in the dependent variable was accounted for by the set of independent variables. The *t* test was used to determine the significance of each predictor and beta coefficients were used to partial out the magnitude of prediction for each independent variable.

## Results

A total of 1,855 participants met inclusion criteria for this analysis. Basic demographic information, descriptive statistics for predictor variables, and Cronbach's alpha for scales (Wave 1 and 2) are included in Tables 1 and 2. Overall, average sexual socialization changed very little over the course of about two years from Wave 1 to Wave 2. Average *sexual knowledge* increased from 0.63 at Wave 1 to 0.65 at Wave 2. Average *sex risk perceptions* increased from 1.82 at

Wave 1 to 2.09 at Wave 2. Average *beliefs about pregnancy* increased from 1.67 at Wave 1 to 1.70 at Wave 2. Average *perceived birth control efficacy* increased from 3.82 at Wave 1 to 3.88 at Wave 2. Average *myths about birth control* increased from 3.87 at Wave 1 to 3.96 at Wave 2. From Wave 1 to Wave 2, participants on average grew to have increased sex knowledge, greater perceptions of risks associated with sex, more liberal beliefs about pregnancy, higher perceived efficacy using birth control, and higher rejection of myths associated with birth control.

A series of sequential multivariate regression analyses were performed to predict the five measures of sexual socialization measured at Wave 2. In the first analysis, *media use* at Wave 1 was not significantly associated with *sex knowledge* at Wave 2 at either step 1 or 2 of the model (see Table 3).

Table 3
*Multiple Regression Results: Sex Knowledge (SK)*

| Variable | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Media Use (Wave 1) | -.01 | .01 | -.04 | -.01 | .01 | -.03 |
| Black | | | | -.01 | .01 | -.02 |
| AINA | | | | .03 | .04 | .02 |
| API | | | | .02 | .02 | .02 |
| Hispanic | | | | -.00 | .01 | -.00 |
| SES | | | | .01 | .00 | .03* |
| Female | | | | .00 | .01 | .01 |
| Age (Wave 1) | | | | .01 | .00 | .03 |
| SK (Wave 1) | | | | .44 | .02 | .45* |
| $R^2$ | | .00 | | | .22 | |
| $F$ for change in $R^2$ | | 3.34 | | | 64.30** | |

*$p < .05$. **$p < .01$.

At step 2, *SES* and *sex knowledge* at Wave 1 significantly predicted *sex knowledge* at Wave 2. At step 2, the model explained 22% of the variance, whereby higher SES and especially higher sexual knowledge at Wave 1 was associated with higher sexual knowledge at Wave 2.

In the second analysis, *media use* at Wave 1 was significantly associated with *sex perceptions* at Wave 2 when entered alone at step 1 (see Table 4). At step 2, *media use* at Wave 1 was no longer significant, although *being Black, SES,* and especially *sex risk perceptions* at Wave 1 were statistically significant predictors of *sex risk perceptions* at Wave 1. The model at step 2 explained 28% of the variance, whereby *Black* race, *male* gender, and higher *risk perceptions* at Wave 1 were predictors of higher *sex risk perceptions* at Wave 2.

Table 4
*Multiple Regression Results: Sex Risk Perceptions (SRP)*

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| Variable | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Media Use (Wave 1) | .07 | .03 | .05* | .01 | .03 | .01 |
| Black | | | | .10 | .05 | .05* |
| AINA | | | | .18 | .19 | .02 |
| API | | | | .05 | .12 | .01 |
| Hispanic | | | | .09 | .06 | .03 |
| SES | | | | -.01 | .02 | -.01 |
| Female | | | | -.11 | .04 | -.06** |
| Age (Wave 1) | | | | .02 | .02 | .02 |
| SRP (Wave 1) | | | | .54 | .02 | .51** |
| $R^2$ | | .00 | | | .28 | |
| $F$ for change in $R^2$ | | 5.46* | | | 88.25** | |

*$p < .05$. **$p < .01$.

In the third analysis, *media use* at Wave 1 was significantly associated with *beliefs about pregnancy* at Wave 2 when entered alone at step 1 (see Table 5). At step 2, *media use* at Wave 1

was no longer a significant, although *Black* race, *SES, age,* and especially *beliefs about pregnancy* at Wave 1 were statistically significant. The model at step 2 explained 23% of the variance, whereby *Black* race, lower *SES,* older *age* at Wave 1, and more liberal *beliefs about pregnancy* at Wave 1 were significant predictors of more liberal *beliefs about pregnancy* at Wave 2.

Table 5
*Multiple Regression Results: Beliefs About Pregnancy (BAP)*

| Variable | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Media Use (Wave 1) | .11 | .03 | .09** | .03 | .03 | .02 |
| Black | | | | .11 | .05 | .05* |
| AINA | | | | .27 | .19 | .03 |
| API | | | | .14 | .12 | .02 |
| Hispanic | | | | .06 | .06 | .02 |
| SES | | | | -.14 | .02 | -.13** |
| Female | | | | .05 | .04 | .03 |
| Age (Wave 1) | | | | .09 | .02 | .10** |
| BAP (Wave 1) | | | | .44 | .02 | .39** |
| $R^2$ | | .01 | | | .23 | |
| $F$ for change in $R^2$ | | 14.80** | | | 66.39** | |

*$p < .05$. **$p < .01$.

In the fourth analysis, *media use* at Wave 1 was significantly associated with *perceived birth control efficacy* at Wave 2, when entered alone at step 1 (see Table 6). At step 2, *media use* at Wave 1 was still a statistically significant predictor of *perceived birth control efficacy* at Wave 2, in addition to *SES* and *perceived birth control efficacy* at Wave 1. At step 2, the model explained 29% of the variance, whereby higher *media use,* lower *SES,* and especially higher *perceived birth control efficacy* at Wave 1 were significant predictors.

Table 6
*Multiple Regression Results: Perceived Birth Control Efficacy (PBCE)*

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| Variable | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Media Use (Wave 1) | .12 | .03 | .11** | .05 | .02 | .05* |
| Black | | | | .02 | .04 | .01 |
| AINA | | | | -.08 | .17 | -.01 |
| API | | | | -.19 | .11 | -.04 |
| Hispanic | | | | -.07 | .05 | -.03 |
| SES | | | | -.06 | .02 | -.06** |
| Female | | | | -.03 | .03 | -.02 |
| Age (Wave 1) | | | | .02 | .02 | .02 |
| PBCE (Wave 1) | | | | .53 | .02 | .52** |
| $R^2$ | | .01 | | | .29 | |
| $F$ for change in $R^2$ | | 24.33** | | | 90.86** | |

*$p < .05$. **$p < .01$.

In the fifth analysis, *media use* at Wave 1 was not significantly associated with *myths about birth control* at Wave 2 at either step (see Table 7). At step 2, not *being AINA or API*, *female* gender, and higher *SES* and especially, higher *myths about birth control* at Wave 1 were statistically significant predictors of higher *perceived birth control efficacy* at Wave 2. The full model explained 29% of the variance.

Table 7
*Multiple Regression Results: Myths About Birth Control (MABC)*

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| Variable | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Media Use at Wave 1 | -.03 | .02 | -.03 | .02 | .02 | .02 |
| Black | | | | -.04 | .04 | -.02 |
| AINA | | | | -.32 | .15 | -.04* |
| API | | | | -.19 | .10 | -.04* |
| Hispanic | | | | -.08 | .05 | -.04 |
| SES | | | | .07 | .02 | .08** |
| Female | | | | .17 | .03 | .12** |
| Age at Wave 1 | | | | .00 | .02 | .00 |
| MABC at Wave 1 | | | | .51 | .02 | .47** |
| $R^2$ | | .00 | | | .29 | |
| *F* for change in $R^2$ | | 1.34 | | | 93.09** | |

*$p < .05$. **$p < .01$.

## Discussion

In each of the full models, the sexual socialization variables at Wave 1 explained the lion's share of the variance in the parallel measure at Wave 2. This suggests that many components of sexual socialization are cultivated early in adolescence and remain relatively consistent across adolescence. Additionally, it is possible that changes in socialization occur later in adolescence and in early adulthood. Thus, the current study, which essentially measures change in sexual socialization over a two-year period as a function of media exposure after these components are largely developed, may underestimate the importance of adolescent media use and media's influence at other stages of the life course.

Still, *media use* at Wave 1 was significantly correlated with three of the five measures of sexual socialization at Wave 2 – *sex risk perceptions, beliefs about pregnancy,* and *perceived birth control efficacy*. Of these three measures of sexual socialization at Wave 2, *media use* at

Wave 1 dropped below significance in each of the full models, except for *birth control efficacy* at Wave 2. When the Wave 1 measure and all other factors were accounted for in the model, youth who reported higher levels of media use also reported greater perceptions of efficacy using birth control at Wave 2. *Media use* at Wave 1 was not correlated with *sex knowledge* or *myths about birth control* at Wave 2. Studies have shown that, among preferred sources of sex education and information, adolescents choose to rely heavily on conventional sources of sex education. Youth in one study of 672 adolescents endorse parents as their most preferred source of sex information, followed by school and peers (Somers & Surmann, 2004). Media, siblings, and self-socialization are endorsed less. A qualitative study on Canadian youth show that youth who did use media as a source of sexual socialization and sexual health information acknowledge that they often receive misinformation regarding sex from media sources (DiCenso, et al., 2001). The utility of adolescent media use for socializing and educating youth about sex can depend on the salience of media's role, relative to other social influences, and the accuracy of information provided by media.

For three of the five measures, race was a significant predictor of sexual socialization at Wave 2, when all other factors were considered in each model 2. Black youth had higher perceptions of sex risk and more casual beliefs about pregnancy at Wave 2 than did their White counterparts. AINA and API participants had lower levels of rejection of myths about birth control than did their White counterparts. Being Hispanic did not significantly predict sexual socialization at Wave 2 for any of the measures of sexual socialization. Race did not significantly predict the *sex knowledge* or *perceptions of birth control efficacy* at Wave 2, when all other factors were also considered.

While some research has examined and found significant racial and ethnic differences in adolescent sexual socialization, those studies primarily focus on different types of sexual socialization from those highlighted in this analysis. For example, one study examined young adolescent girls' perceptions and expectations for the timing of sex roles, and found significant racial/ethnic differences in what young girls perceive and prefer, in terms of timetables for sex role development, in the context of other socioeconomic and sociocultural factors (East, 1998). In another study on young, urban adolescent girls, higher levels of ethnic identity are associated with less risky sexual attitudes when other psychosocial factors, including school interest, self-esteem, religiosity, and family cohesion, are controlled (Belgrave, van Oss Marin, & Chambers, 2000).

Both *gender* and *SES* were significant predictors of sexual socialization at Wave 2 for several of the measures. *SES* significantly predicted all except one measure of sexual socialization at Wave 2 – *sex knowledge, beliefs about pregnancy, perceived birth control efficacy* and *myths about birth control*, when all other factors were considered in the full model. On average, youth with higher socioeconomic status had higher sex knowledge, more conservative views about pregnancy, lower perceptions of birth control efficacy, and higher rejection of myths about using birth control. *Gender* significantly predicted three measures of sexual socialization at Wave 2 - *sex knowledge, sex risk perceptions,* and *myths about birth control*, when all other factors were considered in the full model. On average, females had higher sex knowledge, lower sex risk perceptions, and higher rejection of myths about birth control than males. The significance of gender in predicting differences in sexual socialization is well-documented in research. In a previous study, aspects of sexual socialization, including sources of information, counseling on sexuality, and the messages received about sexuality through

socialization varied significantly by gender (Measor, 2004). In the previous study and current analyses, boys and girls seem to have different sexual socialization experiences that may result from having different levels of access to, and varied preferences for different kinds of information. *Age* at Wave 1 was only a significant predictor for beliefs about pregnancy at Wave 2.

There are several limitations to this study. First, media use, measured by weekly hours of conventional media consumed, neither accurately nor comprehensively measured the amount of sexy media content consumed. One might assume that the more media consumed in general, the more likely one is to be exposed to sexy media, and that the total amount of media consumed is proportional to the amount of sexy media that individuals are exposed to. Still, the media use variable did not accurately reflect this, nor was the ways in which youth engage media content considered. In regard to sexual socialization, this particular analysis did not consider other sources of socialization (e.g., peers, parents, schools), and thereby, did not explore the relative role of media in influencing sexual socialization. The study procedures (i.e. the focus on five types of sexual socialization, the age of youth providing data on sensitive topics) yielded a drastically reduced study sample. Still, there was a sufficient amount of data for the highlighted analysis. Analyses that aim to more comprehensively and robustly explore adolescent sexual socialization must have the requisite power in order to include as many relevant variables as possible. Lastly, sample weights were not used in this analysis, and so the findings of this study are generalizable not to the general population, but rather are descriptive of the sample central in the analysis.

## Conclusions

This study offered a glimpse into the complexity of adolescent sexual socialization, and the ways in which social demographic and societal factors influenced the sexual socialization trajectories of youth across a small span of adolescent development. While for some aspects of sexual socialization, demographic factors and media use modestly predicted levels of sexual socialization later in adolescence, what was most strongly associated with sexual socialization later in adolescence was the level of earlier adolescent sexual socialization. Perhaps, this indicates that middle and high school is too late of a developmental time period to examine the changes in sexual socialization as a function of media use.

Sexual socialization is a process that is influenced by multiple factors in complex ways, particularly during adolescence. Demographic characteristics, such as race/ethnicity, gender, and socioeconomic status, are factors that can help elucidate patterns of how sexual socialization changes for youth from early to later in adolescence. These factors may reflect the ways in which hegemonic influences along social divisions by race, ethnicity, class status, and gender shape the ways in which individuals are socialized about sex, and how socialization is mediated in society. Media use, rather, is a social factor - one agent of socialization which, in some instances, can have a direct, albeit modest relationship to how adolescent sexual socialization changes across adolescence, when other factors are considered. As this study suggested, this relationship likely varies in strength and significance across different domains of sexual socialization.

Although existing research generally focuses on links between the use of some forms of media and associated sexual attitudes, there is still a need for studies that explore the underlying mechanisms influence how media socializes youth. Research should also consider the gendered nature of media content and differentiated media messages targeting men and women (2003). To

address these factors, intersectionality – a term coined by legal scholar, Kimberlé Crenshaw (1991) – is particularly useful as both a conceptual framework and analytic tool. Intersectionality, according to Collins and Bilge (2016), is "a way of understanding and analyzing the complexity in the world, in people, and in human experiences" (p. 2). Intersectionality frames the experiences of individuals as being shaped, not by one single dimension of social division, but rather at intersections of many axes of social division, taken together.

Future research directions should address the complexity of adolescent sexual socialization as a multi-faceted construct, while also considering the timing of sexual socialization processes in the context of other societal factors. Research should examine adolescent sexual socialization and its multiple domains, in order to further understand how, for particular themes of sexual socialization (e.g., pregnancy, birth control, sexual perceptions, sex knowledge), certain social and demographic factors can be more or less influential. Studies that consider, not only cross-sectional relationships, but also cross-lagged influences among demographic factors, social influences, and adolescent development might contribute to a greater understanding of the multi-level influences on youths' sexual development and behavior. This research also informs the development of interventions and policies pertaining to adolescent sexual socialization and development, highlighting the importance of timing of intentional and healthful sexual socialization efforts earlier in adolescence when youth are more malleable and impressionable.

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# CHAPTER 4

## Adolescent Media Use, Race, Gender and the Timing of Initiation of Various Sexual Behaviors Among Heterosexual Youth

### Introduction

Sexually transmitted infection (STI), teenage pregnancy and other sex-related consequences pose significant public health challenges for youth and young adults. While young people aged 15 to 24 years old comprise only about a quarter of the sexually active population, they carry a disproportionately high burden of sexually transmitted infection, accounting for over half of 20 million new cases of sexually transmitted infection (e.g., chlamydia, gonorrhea, syphilis) in the U.S. each year (U.S. Centers for Disease Control and Prevention, 2016). Additionally, youth aged 13 to 24 years acquire 22% of new cases of human immunodeficiency virus (HIV) annually (U.S. Centers for Disease Control and Prevention, 2016). While in 2014 teenage pregnancy reached a historic low, still 250,000 babies were born to young women aged 15 to 24 years (U.S. Centers for Disease Control and Prevention, 2017).

One factor that is linked to increased risk for STIs, unintended pregnancy, and other negative sexual health consequences among youth and young adults is early initiation of sexual activity. Individuals who initiate sexual intercourse earlier in adolescence are more likely to contract an STI later in development (Kaestle, Halpern, Miller, & Ford, 2005). Sexually active girls aged ≤15 years are almost twice as likely to report a gap in contraceptive use than women ≥18 years old (Magnusson, Masho, & Lapane, 2012). Three-quarters of pregnancies among teens aged 15 to 19 years are described as unintended (Finer & Zolna, 2016); teens who initiate sex early (e.g., aged 14 years or younger) are less likely to have used contraception at first sex and take longer to begin using contraception (Finer & Philbin, 2013), a pattern that places

adolescents at risk for early and unplanned pregnancy. With the high incidence of STIs and unintended pregnancies among adolescents, early sexual initiation and associated risky sex behaviors (e.g., delayed or non-use of contraception) are significant public health issues.

Adolescents develop sexually in multiple contexts that span multiple levels of social organization through engaging in interactions and processes within their social environments, acquiring sex knowledge, skills, motivation, behaviors and abilities over the life course (Bronfenbrenner & Morris, 2006). Adolescents receive complex and, at times, conflicting messages, signals, and cues about sexual behavior via multiple developmental and socialization processes, including media socialization. In adolescence, media emerge as major social influences in the lives of youth, among family, school, and community environments, especially as relates to shaping their sexual attitudes, intentions and behaviors (L'Engle, Brown, & Kenneavy, 2006). From early adolescence through the late teen years, adolescents spend about a third of their day exposed to media content (Escobar-Chaves, et al., 2005). In recent years, content analyses of popular music (Hall, West, & Hill, 2012), music videos (Wallis, 2011), television (Kunkel, et al., 2007), movies (Potts & Belden, 2009), video games (Stermer & Burkley, 2012), print (Reichert & Carpenter, 2004), Internet (Pardun, L'Engle, & Brown, 2005), and other media have revealed that media contains substantial amounts of sexualized content - often more than in previous decades - and more sexually-explicit or degrading images and messages than ever before. Further, as little as 1% of the conventional media popular among youth contains information about or depictions of sexually healthy behavior (Hust, Brown, & L'Engle, 2008).

Literature abounds with studies that links adolescent media use and exposure to sexual behavior (e.g., sexual initiation, risky sex, more progressive sexual activity) (Villani, 2001), but

far less is known about how media use influences the timing of initiation of diverse sex behaviors during adolescence. Recent studies have offered conflicting evidence regarding the significance of the relationship between media use and sexual initiation. While several studies examining the influence of television viewing of sexual content have concluded that a significant statistical and predictive relationship exists between sexy TV viewing and subsequent sexual initiation (Collins, et al., 2004; Ashby, Arcari, & Edmonson, 2006; Collins, Martino, Elliott, & Miu, 2011; Collins, Martino, & Elliott, 2011; Brown J. D., 2011), other research contends that sexy media does not hasten sexual initiation in adolescents (Steinberg & Monahan, 2010). Still, others have found that the relationship between television viewing of sexy content and sexual behavior "works both ways" (Bleakley, Hennessy, Fishbein, & Jordan, 2008). That is, both non-recursive (simultaneous) and prospective longitudinal (e.g., causal) relationships exist between media exposure and sexual behavior. Across these longitudinal studies, multiple different analytic strategies (e.g., multivariate regression analyses, propensity score matching) were used to examine how TV viewing predicts the subsequent initiation and/or escalation of sexual intercourse and other sex behaviors during adolescence. And while research suggests that there are gendered and racial/ethnicity-related patterns of media use and exposure (Rideout, Foehr, & Roberts, 2010), few studies have explored how the link between media use and sexual initiation can differ by race, gender, and other factors (e.g., socioeconomic status), as well as at intersections of these factors.

In the current study, I add to the discourse and the methodological diversity of approaches examining adolescent media use and the initiation of sexual intercourse across the life course. Informed by insights from the bioecological framework for adolescent media sexual socialization (BFAMSS) (Bethune, 2016) and by findings from the previous chapter, my study

takes up adolescent media use and its influence on the timing of the initiation of various sexual behaviors. My analysis centers adolescent media use in general, and takes into consideration the ways in which adolescent media use, race, gender, and socioeconomic status may independently or interactively influence the timing of various sex behavior across the life course. To explore these dynamics, I ask the following research questions:

1) *Does adolescent media use predict the timing of initiation of sexual behaviors (i.e., vaginal penetrative, anal, and oral sex) across adolescence and early adulthood?*
2) *Does adolescent media use predict the timing of initiation of sexual behaviors, when race, gender, and socioeconomic status are also considered?*

Using Add Health longitudinal data and survival analysis, I examine these relationships among youth and young adults who self-report opposite-sex attraction. A similar analysis is conducted later in this dissertation, focusing on youth who report same-sex attraction. At the end of this chapter, implications of my findings and recommendations for future research are discussed.

## Literature Review

Puberty brings about sweeping biological, psychological, and social changes in adolescents. Biologically, adolescents undergo growth and development of primary and secondary sex organs and hormonal activation – which drives development towards physical maturation. These hormonal changes induce psychological shifts that increase adolescents' cognitive and emotional capacity and impact their ability to understand, initiate, and engage in sex. During this time, youth are socialized within their family, school, and other social networks. Parents, peers, and teachers are primary socializers in regard to sexual development. However, as

youth grow older and develop, they begin to rely more on media as a source of information, shaping their beliefs about sex (Bleakley, Hennessy, Fishbein, & Jordan, 2009).

As adolescents gain the psychological capacity to perceive and understand more of the world, and as the need for information grows, media emerges as a useful, accessible, and effective source of socialization. Several theories help us to understand how media helps individuals construct meaning, interpret their environments, and engage in interactions within their social worlds. Cultivation theory posits that exposure to media (e.g., television), over time, subtly cultivates viewers' perceptions of reality (Gerbner, Gross, Morgan, & Signorielli, 1986). Insights from media dependency theory help us to recognize linkages between the audience viewing media, the media content itself, and how both are connected to larger social systems (Ball-Rokeach & DeFleur, 1976). In regard to sexuality, sexual scripts theory – first introduced by sociologists William Simon and John H. Gagnon – helps us to understand how human sexuality emerges from cultural, social, and personal symbols and experiences of individuals, thereby constructing meaning and "scripts." For adolescents, early sexual scripts are derived from socialization and provide directions regarding individuals' possible sexual preferences, perceptions, and behaviors within society (Moore & Rosenthal, 2007). When pertinent and relevant information is scarce or inaccessible, consumption and interaction with media can facilitate an individual's developing perceptions of society, and information and scripts to make meaning of it.

**The Bioecological Framework for Adolescent Media Sexual Socialization**

To fully understand the multidimensional, dynamic nature of adolescent sexual socialization and development, as well as the unique role that media plays in the context of other

biopsychosocial factors and social influences, a robust ecological developmental framework is particularly useful. The bioecological framework for adolescent media sexual socialization (BFAMSS) draws insights from three theoretical perspectives on human development: (1) life course perspectives, (2) social ecological perspectives, and (3) media effects (Bethune, 2016). This framework not only considers the contexts (e.g., media) in which youth are proximally embedded, but also models how more distal contexts, systems, institutions, and dynamics (e.g., racism/sexism via race and gender) influence adolescent socialization and behavior.

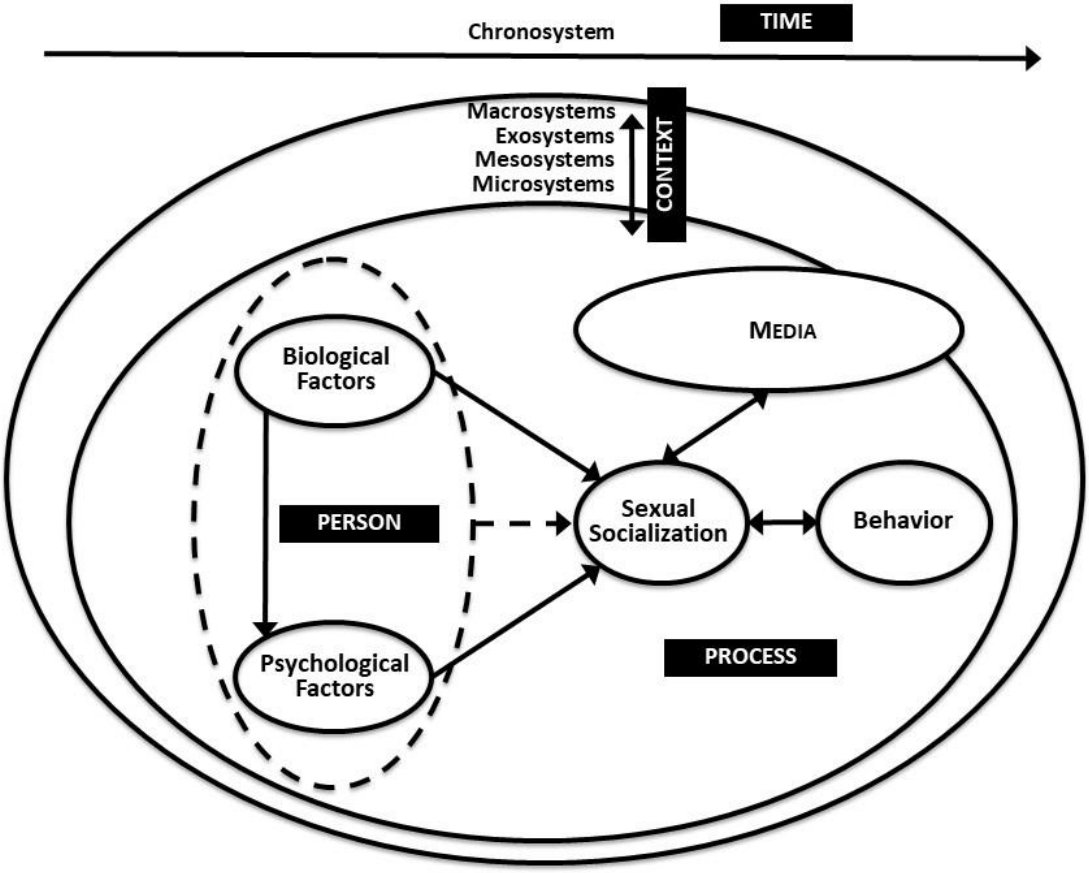


*Figure 3*. Bioecological Framework for Adolescent Media Sexual Socialization

The framework, depicted in Figure 3, describe the relationships to between media, sexual socialization and behavior, in the context of other social influences and systems. The first of the framework's three propositions inform the analysis presented in this chapter.

Proposition 1 states:

> By means of both conventional (e.g., radio, videos, television, magazines and other print media) and newer media forms (e.g., digital, social, and online), media are a salient and direct source of information, (re)presentations, imagery, and scripts that contributes significantly to the sexual socialization and behavior of adolescents as they transition from childhood to early adulthood.

In other words, media use during adolescence contributes to the sexual socialization of individuals in ways that ultimately shape and inform sex behaviors that emerge throughout development. Mass media is an important context for adolescent sexual socialization, behavior and development, and is significantly correlated with youth intentions to have sex, and youth engagement in light to heavy sex behaviors (L'Engle, Brown, & Kenneavy, 2006). The mass media targeted at and consumed by adolescents abounds with suggestive and explicit sexual references (Callister, Stern, Coyne, Robinson, & Bennion, 2011; Hall, P. C., West, & Hill, 2012; Ybarra & Mitchell, 2005). On few occasions, responsible messages that actually promote safe sex, abstinence and sex-related health risks are included (Collins, Elliott, Berry, Kanouse, & Hunter, 2003; Ward, Day, & Epstein, 2006). Taken together, sex-related messages and images represented in media can affect how youth understand, process and apply information about sex, and can inform the development of certain sex behaviors.

**Adolescent Media Use and Sexual Initiation**

Media socialization shapes the beliefs, attitudes, and behaviors of adolescents and is influential in how young people are socialized in regard to their sexuality. As a source of broad socialization, mass media and their diverse array of media constructions, encompassing various social influences and potential models of development, promote variability in social and psychological processes during development (Arnett, 1995). It is estimated that about half of adolescents aged 13-18 years old actively seek sexual media content from at least one media source (Bleakley, Hennessy, & Fishbein, 2011). Movies, followed by television, music, and pornography websites, respectively, were the most frequented sources for sexual content cited by youth. Adolescents – who may otherwise be ill-equipped to navigate and adjust to increasing opportunities for sexual interaction – seek information in order to understand and execute sexual developmental tasks (Chapin, 2000). In a study involving 189 high school-aged adolescents, researchers found that the youth used media to indirectly obtain information about the world, and to avoid the social risks that are associated with social learning through direct experience (LaFerle, Edwards, & Lee, 2000). Teens who report having had vaginal sex in their lifetimes are significantly more likely to report actively seeking out sexual media content than are youth who do not report having initiated sex (Bleakley, Hennessy, & Fishbein, 2011).

An overwhelming majority of studies examining the relationship between conventional media use (e.g., music, movies, television viewing) and sexual initiation conclude that the two are linked. Studies have explored the influence of listening to either degrading or non-degrading sexual lyrics on sexual initiation and the development of non-coital sexual activity (Martino, et al., 2006). Researchers found that, while non-degrading lyrics do not influence sex behaviors over a two-year period, youth who listen to more degrading lyrics are more likely to initiate sex

and advance to higher levels of non-coital sexual activity. In another longitudinal study examining exposure to sexual lyrics in music showed that listening to popular music – and in particular, the type that contains sexually-explicit or degrading lyrics – is linked to the early sexual initiation in youth and their progression to more advanced sexual activities over the course of their development (Primack, Douglas, Fine, & Dalton, 2009; Martino, et al., 2006). For movies, self-reported viewing of sexual content in popular movies by adolescents is linked to early sexual debut and engagement in sexual risk behaviors in a longitudinal study (O'Hara, Gibbons, Gerrard, Li, & Sargent, 2012).

Reviews of literature suggest television viewing of sexual content is antecedent to and a risk factor for sexual initiation among adolescents (Kirby, 2002). In a longitudinal study involving 1,792 adolescents, consumption of more sexual television content is associated with a higher likelihood of sexual initiation and progress to more advanced non-coital sex behaviors within the following year (Collins, et al., 2004). Similarly, in a study of 4,808 young adolescents (<16 years old), researchers found that adolescents who report higher daily television viewing (>2 hours per day) have a higher likelihood for sexual debut within a year's time, especially among youth who perceive parental disapproval of sexual activity and among youth who lack parental regulation of television programming (Ashby, Arcari, & Edmonson, 2006). However, for adolescents with the highest level of daily television viewing (>5 hours per day), there is no significant increase in risk for sexual initiation. The researchers suggest that this finding lends support to the "babysitter effect" or displacement effect, whereby adolescents who spend extreme amounts of time-consuming television are less likely to participate in other activities (i.e., initiating sexual activity), as a result of having less free time available to do so.

During adolescence, youth develop and experience an increase cognitive capacity and malleability that creates additional possibilities for their sexual socialization. Research has shown that, leading up to sexual initiation, 12- to 14-year-old adolescents have varying degrees of cognitive susceptibility to the onset of sexual intercourse which, in turn, mitigates the influence of sexual socialization on sex behavior (L'Engle & Jackson, 2008). Cognitive susceptibility entails having greater propensity toward more permissive attitudes toward teen sex behaviors, greater perceived likelihood to initiate sex in the near future, a greater sense of readiness for sex, and greater beliefs regarding sexual engagement when opportunities to do so are present. In their study, L'Engle and Jackson found that the influence of media socialization and other social influences (e.g., parents, peers, schools) on adolescent sexual behavior is partially mediated by adolescents' cognitive susceptibility to sexual initiation. Still, mass media and other social influences are directly and significantly associated with sexual behavior during adolescence, even while the role of cognitive processes was considered.

Socializing agents, such as media, can also impact other psychosocial factors in adolescents – such as perceptions and decision-making patterns. For example, in a cross-sectional study involving over 1000 Black and White adolescents in the southeastern region of the United States, researchers found that media (e.g., sexual media diets, perceptions of sexual norms via media) influences the intentions of youth to engage in sexual behaviors, as well as engagement in light and heavy sexual behaviors (L'Engle, Brown, & Kenneavy, 2006). Another psychosocial mechanism – sensation-seeking – partially explains how adolescent sexy media exposure (e.g., sexy media content in movies) leads to subsequent sex risk engagement and behavior in a nationwide sample of 1,228 participants (O'Hara, Gibbons, Gerrard, Li, & Sargent, 2012). In young adolescents ($7^{th}$ and $8^{th}$ graders), exposure to certain types of media (e.g.,

movies, music) among conventional media types (i.e., TV, music, Internet sites, movies, newspapers) is a predictor of intentions to have sex and sexual behavior (Pardun, L'Engle, & Brown, 2005).

**Race, Gender, Media and Timing of Sexual Initiation**

A few studies have explored and illuminated unique intersections of race/ethnicity, gender, class and media use and their influence on sexual initiation. A study by Collins et al. (2004) examining the influence of television viewing on sexual initiation revealed a race-by-media use interaction. In the study, African American adolescents who consume higher levels of sexual content on television, interestingly, have a significantly lower likelihood of both sexual initiation and progression toward more advanced non-coital sexual activity than their White counterparts. A study that examined the interactions of race and ethnicity as predictors of adolescent sexual initiation showed that the importance of including both race and ethnicity/immigrant status in models of adolescent behavior (Spence & Brewster, 2010). While racialized patterns of sexual initiation (e.g., Asian girls/boys with relative lower risk, Black girls/boys with higher relative risk than White peers) are consistent with existing literature, the study findings suggest that both ethnic identity and the extent to which youth are acculturated (i.e., immigrant status) are both contingencies that influence the development of sexual behaviors.

Research has also shown that gender is an important predictor of sexual media-seeking behaviors among adolescents. In a study examining the sexual media selection patterns in adolescents ages 13-18 years old, male adolescents are significantly more likely to report seeking out sexual media content than are females (Bleakley, Hennessy, & Fishbein, 2011). In a study

that examined the relationship between sexual attitudes, perceptions, and sexual initiation, researchers found that race and gender predict sex attitudes and perceptions, and that further race- and gender-based differences persist through the ways in which attitudes influence subsequent coital debut (Cuffee, Hallfors, & Waller, 2007). Another study that examined the timing of sexual debut from adolescence across the life course revealed both racial and gender group differences. For example, African American males experience sexual debut earlier than all racial-gender subgroups, while Asian males and females experience later sexual debut than their racial/ethnic counterparts (Cavazos-Rehg, et al., 2009). In another study, it was estimated that while about one-third of sexually-active adolescents engage in early sex (≤14 years old), sexually-active, urban Black and Hispanic students are significantly more likely to report early sex initiation than their sexually-active White and Asian/Pacific Islander racial-ethnic counterparts (Kaplan, Jones, Olsen, & Yunzal-Butler, 2013). These racial/ethnic differences are found to be consistent among both female and male students. Research on child health has often shown socioeconomic status to interact both with race/ethnicity and gender; as a result, it is recommended that the confluence of race, class, and gender be included as explanatory variables in studies on child health (Committee on Pediatric Research, 2000). Cross-sectional analyses have shown both race and socioeconomic status (i.e., parental education) to be significantly associated with having had sexual intercourse among both young females and males in models that explore contextual factors related to sexual behavior (Santelli, Lowry, Brener, & Robin, 2000).

Intersectionality – a term coined by legal scholar, Kimberlé Crenshaw (1991) – serves as a particularly useful conceptual framework and analytic tool for understanding the additive and multiplicative influences of several social factors within society. Intersectionality, according to

Collins and Bilge (2016), is “a way of understanding and analyzing the complexity in the world, in people, and in human experiences” (p. 2). Intersectionality frames the experiences of individuals as being shaped, not by one single dimension of social division, but rather at intersections of many axes of social division, taken together. Public health scholar, Lisa Bowleg (Bowleg, 2012), outlines three core tenets of intersectionality that are relevant to public health. She notes, (1) “social identities are not independent and unidimensional but multiple and intersecting,” (2) “people from multiple historically oppressed and marginalized groups are the focal or starting point,” and (3) multiple social identities at the micro level intersect with macro level structural factors to illustrate or produce disparate outcomes (p. 1268). Some recent studies that use survival analyses to predict sexual initiation have included only some of these demographic variables. One such study compared the likelihood of sexual debut for race-by-sex subgroups of youth and found significant differences among most subgroups (Cavazos-Rehg, et al., 2009). In order to fully understand the complexity associated with sexual initiation, it is imperative to consider the confluence of race, gender, and socioeconomic status as potential moderators of media’s influence on sexual initiation.

Building on Chapter 3’s findings, the following analysis explores further the role of media in adolescent sexual development. In this case, I consider how media function collectively as a socializing agent for adolescents and examine how media thereby influence the initiation and timing of sexual behaviors over time. Further, acknowledging how media can project and promote racialized and gendered representations and messages and understanding how societal level influences help construct the ways in which sexuality is understood and experienced in adolescence, I consider the effects of socioeconomic status and also explore how the timing of sexual initiation differs at intersections of race, gender, and media use.

## Methods

This study used data from the National Longitudinal Study of Adolescent Health (Add Health)[4]. Add Health is the largest and most comprehensive survey of adolescents undertaken in the United States. The study began in 1994 with an in-school questionnaire, administered to a group of over 90,000 middle- and high-schoolers from a sample of 80 high schools and 52 middle schools from across the US. selected with unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured this sample was representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. Of those students, a portion were selected to participate in an in-home interview the same time period (1994-1995). The initial wave consisted of the in-school and in-home questionnaires, vocabulary data, spatial data, school administrator responses and a parent questionnaire, and was followed up by three more data collection periods to date (Harris, et al., 2009). A 50% sample of Wave 1 in-home questionnaire data was available for public use, along with responses in Waves 2, 3, and 4.

### Procedures

Publicly-available data from the in-home interview questionnaires administered during Waves 1, 2, 3, and 4 of the Add Health study were used in this analysis. The study population consisted of adolescents in grades 7 through 12 across the U.S. who completed an in-home questionnaire at Wave 1 from 1994 – 1995, and who were a part of the public-use subset of data.

[4] This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis.

Wave 2 (N=4,834) was collected from April through August 1996, Wave 3 was collected from 2001 – 2002, and Wave 4 was collected in 2008 through follow-up interviews (Harris, et al., 2009). Institutional review board procedures were conducted for the larger study. The Institutional Review Board at Vanderbilt University was consulted for supplemental review of the current study; an application for review exemption was submitted and approved.

This analysis focused on the timing of initiation of various sex behaviors– vaginal-penetrative intercourse, oral sex, and anal sex. Research suggests that when more diverse sexual behaviors (e.g., coital and non-coital) are considered, then adolescents may exhibit varying sexual developmental trajectories within or outside of romantic relationships across racial, ethnic, gender, sexual orientation, and other subgroups of adolescents (Boislard, van de Bongardt, & Blais, 2016). As a rule of thumb, a minimum is 10 events (i.e. initiating sex) per predictor variable is suitable for a conservative approach to running Cox models (Vittinghoff & McCulloch, 2007). When data were stratified by race-by-gender subgroups, only racial groups that, when split by gender, had sufficient sample size (i.e., White, Black, Hispanic youth) were included in my analyses.

Participants who provided complete data for the key predictor, outcome and co-variate variables that are central to each respective analysis were included in this study (see Figure 4). Exclusion criteria included participants having missing data for any key variables central to each separate analysis, who did not report sexual attraction, or who reported same-sex attraction at Wave 3 or 4. Sexual attraction is measured using Wave 3 and 4 self-reported data when participants were asked, on a scale of 1 to 6 (1= 100% heterosexual to 5= 100% homosexual, 6 = no sexual attraction to males or females), how they would describe their sexual attraction.

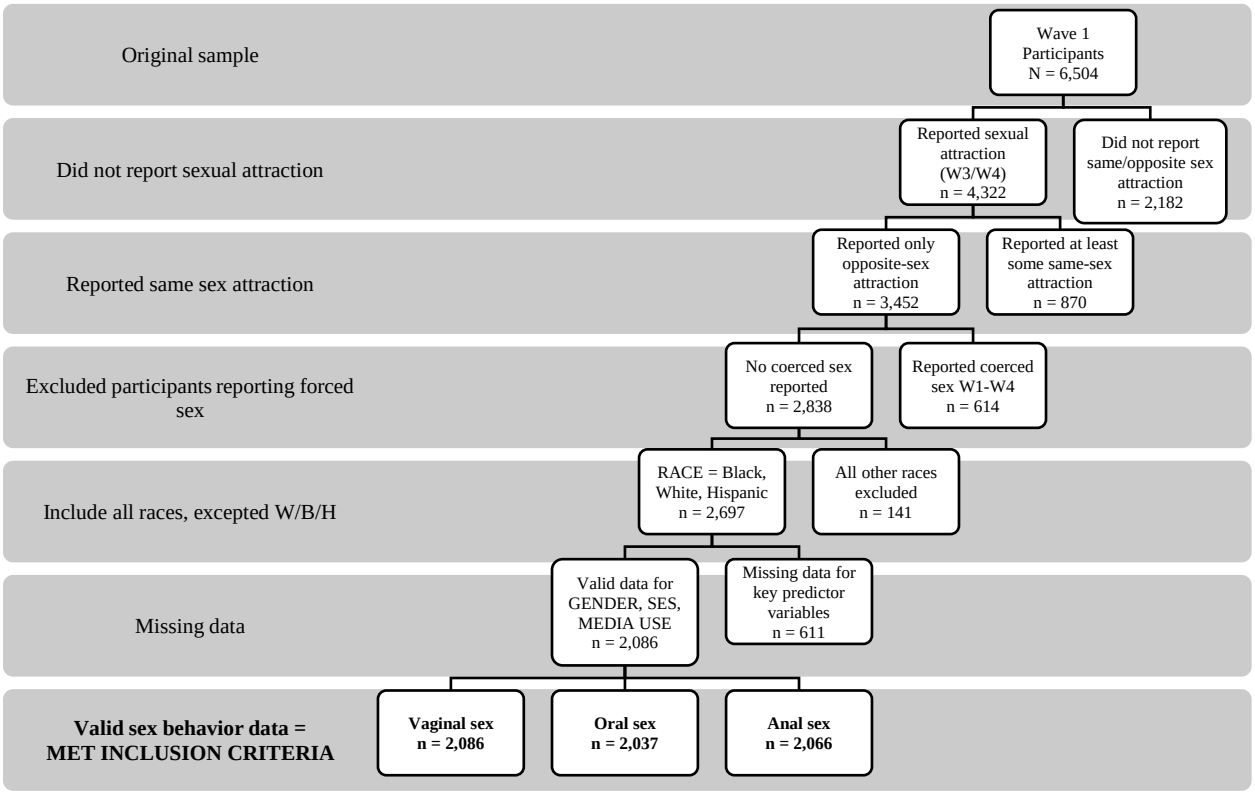


*Figure 4*. Inclusion/Exclusion Criteria for Opposite-Sex-Attracted Participants

Experiencing sexual abuse – like other forms of child abuse – can have dire consequences in the form of psychological and behavior disturbances across development (Collin-Vezina, Daigneault, & Hebert, 2013). Of those participants who reported only opposite-sex attraction across Waves 1 through 4 (N=3,452), the 614 (17.8%) participants who reported having experienced forced or coerced sex any of Waves 1 through 4 were excluded from this analysis. Victims of childhood sexual abuse need more nuanced analysis performed for future research.

**Demographic Characteristics**

Demographic information included participants' race, gender, SES (e.g., household income, parental education), and age (in years) at Wave 1. Table 8 shows the demographic characteristics of participants who were included in analysis for each sexual behavior highlighted. Attrition analysis was performed using chi-square and analysis of variance in order to highlight key differences among opposite-sex attracted participants between those included in and excluded from this analysis. For each sex behavior, White and male participants were slightly more likely to be included in analyses than their Black/Hispanic or female counterparts[5].

Independent samples t-tests were performed comparing the means of age in years at Wave 1 for participants, highest parental education, and annual household income between participants who were either included or excluded from each analysis. For the both vaginal sex[6] and oral sex[7] analyses, included participants, on average, did not differ in income from those

[5] For the vaginal sex analysis, included participants differed from those excluded by gender, $X^2$(1, N=3,452) 73.4, $p$<.01; and by race, $X^2$(5, N=3,452) 295.4, $p$<.01. For the oral sex analysis, included participants differed from those excluded by gender, $X^2$(1, N=3,452) 75.2, $p$<.01; and by race, $X^2$(5, N=3,452) 288.6, $p$<.01. For the anal sex analysis, included participants differed from those excluded by gender, $X^2$(1, N=3,452) 74.1, $p$<.01; and by race, $X^2$(5, N=3,452) 290.6, $p$<.01.

[6] For vaginal sex, the mean household income of opposite-sex attracted participants included ($M$ = $47,800) was not significantly different from those excluded ($M$ = $45,100). However, the mean age (in years) of included participants ($M$ = 15.9, $SD$ = 1.7, N = 2,086) was significantly, but not substantively lower than that of excluded participants ($M$ = 16.2, $SD$ = 1.8, N = 1,366), $t$(3,450) =-5.8, $p$<.001, two-tailed. The mean level of highest parental education among included participants ($M$ = 7.3, $SD$ = 2.2, N = 2,167) was significantly, but not substantively higher than that of excluded participants ($M$ = 7.1, $SD$ = 2.3, N = 859), $t$(3,024) =2.8, $p$ <.001, two-tailed.

[7] For oral sex, the mean household income of opposite-sex attracted participants included ($M$ = $47,900) was not significantly different from those excluded ($M$ = $44,800). However, the mean age (in years) of included participants ($M$ = 15.9, $SD$ = 1.7, N = 2,037) was significantly, but not substantively lower than that of excluded participants ($M$ = 16.2, $SD$ = 1.8, N = 1,415), $t$(3,450) = -6.0, $p$<.001, two-tailed. The mean level of highest parental education among included participants ($M$ = 7.3, $SD$ = 2.2, N = 2,037) was significantly, but not substantively higher than that of excluded participants ($M$ = 7.1, $SD$ = 2.3, N = 989), $t$(3,024) =2.8, $p$ <.001, two-tailed.

excluded, but were slighter younger and had slightly higher parental education. For anal sex analyses[8], included participants, on average, did not differ in income or parental education, but were slightly younger than excluded participants.

Table 8
*Demographic Characteristics of Opposite-Sex Attracted Participants*

| Characteristic | Opposite-Sex Attracted Participants N = 3,452 % (n) | Vaginal Penetrative Sex Sample N = 2,086 % (n) | Oral Sex Sample N = 2,037 % (n) | Anal Sex Sample N = 2,066 % (n) |
|---|---|---|---|---|
| Race/Ethnicity | | | | |
| White | 62.1 (2,144) | 68.7 (1,433) | 69.3 (1,411) | 68.8 (1,422) |
| Black/African American | 23.4 (809) | 22.1 (462) | 21.6 (439) | 22.0 (455) |
| American Indian/Native American | 0.7 (24) | -- | -- | -- |
| Asian or Pacific Islander | 3.2 (109) | -- | -- | -- |
| Hispanic/Latino | 9.6 (333) | 9.2 (191) | 9.2 (187) | 9.1 (189) |
| Other | 1.0 (33) | -- | -- | -- |
| Gender | | | | |
| Female | 50.6 (1,746) | 44.7 (932) | 44.4 (905) | 44.6 (921) |
| Male | 49.4 (1,706) | 55.3 (1154) | 55.5 (1,132) | 55.4 (1,145) |
| Highest Parental Education | | | | |
| 8th grade or less | 2.4 (82) | 2.4 (50) | 2.4 (49) | 2.4 (50) |
| More than 8th grade; did not graduate HS | 5.3 (182) | 5.5 (115) | 5.5 (113) | 5.6 (115) |
| Business/trade/vocational school, instead of HS | 0.5 (16) | 0.5 (11) | 0.5 (10) | 0.5 (10) |
| HS graduate | 18.0 (621) | 20.3 (424) | 20.1 (409) | 20.1 (415) |
| Completed GED | 4.2 (146) | 4.4 (99) | 4.7 (95) | 4.7 (97) |
| Business/trade/vocational school after HS | 8.3 (286) | 9.5 (198) | 9.4 (191) | 9.5 (197) |
| Some college, did not graduate | 17.8 (614) | 19.9 (416) | 20.3 (414) | 20.0 (414) |
| Graduated, 4-year degree | 16.3 (564) | 18.9 (395) | 18.9 (386) | 18.9 (391) |
| Training beyond 4-year degree | 14.9 (515) | 18.1 (378) | 18.2 (370) | 18.2 (377) |
| Other | 12.3 (426) | -- | -- | -- |
| | Mean *(SD)* | Mean *(SD)* | Mean *(SD)* | Mean *(SD)* |
| Age (at Wave 1) | 16.0 (*1.7*) | 15.9 *(1.7)* | 15.9 *(1.7)* | 15.9 *(1.7)* |
| Household Income (in thousands of dollars) | 47.2 *(44.9)* | 47.8 *(44.7)* | 47.9 *(44.8)* | 47.9 *(44.8)* |

[8] For anal sex, neither the mean household income ($M$ = $47,900) nor the highest level of parental education ($M$ = 7.3) of opposite-sex attracted participants included was not significantly different from those excluded ($M$ = $44,600; 7.1). However, the mean age (in years) of included participants ($M$ = 15.9, $SD$ = 1.7, N = 2,066) was significantly, but not substantively lower than that of excluded participants ($M$ = 16.2, $SD$ = 1.8, N = 1,386), $t(3,450) = -5.8$, $p < .001$, two-tailed.

**Independent Variables**

In this analysis, media use was the main predictor variable of interest, and race, gender, and socioeconomic status were covariates that were relevant to adolescent media use and sexual initiation, or that have been included in previous studies on this subject. Below is a description of how these factors were measured and operationalized for analysis. Table 8 contains more detailed information about each of the covariates.

**Race.** *Race* (reported in Table 8) was computed using Wave 1 and 2 (discrepancies corrected) race and ethnicity data. Two dummy-coded variables (1= "Yes"; 0= "No") indicated whether participants reported that they were (1) White (i.e., "0" for both dummy variables), (2) Black or African American, or (3) Hispanic.

**Gender.** Gender (reported in Table 8) was binary, or "dummy"-coded using Wave 1 and 2 (discrepancies corrected) self-reported binary biological sex data. As the original variable was comprised of only two categories, a single dummy variable is sufficient to capture the information (Hardy, 1993), whereby *gender,* 1= "female"; 0= "male".

**Socioeconomic status.** Many studies have highlighted the difficulty and challenge of defining and measuring socioeconomic status for adolescent health research. While some research suggests that economic factors are most strongly correlated with subsequent health (Duncan, Daly, McDonough, & Williams, 2002), other research emphasizes that socioeconomic factors - such as education and income - are not interchangeable, and therefore, no single measure is best representative proxy for SES (Braveman, et al., 2005). Often, current income, and education - which are commonly associated with various health outcomes – as well as other sociodemographic factors are used as variables or as parts of a composite measure that can yield

a socioeconomic gradient (Shavers, 2007; Goodman, 1999; Bradley & Corwyn, 2002; Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010).

To measure *socioeconomic status* in this analysis using Add Health data, parent reports of education and household income were used from the in-home questionnaire. For each respondent, the highest level of education was reported for each of up to two parents. Similar to conventions used in previous Add Health studies, these data were re-coded to ordinal values, ranging from 1= "8$^{th}$ grade or less" to 8= "training beyond a 4-year degree" (see Table 8 for demographic breakdown). Then, the highest level of parental education between the two parents was computed, then standardized using the z-score, yielding *parental education*. For each participant, the total household income, in thousands of dollars, was reported by a parent. To address the nonnormality (i.e., positive skewedness) of the reported household income data, the natural log of this value was computed, then standardized using the z-score, resulting in *household income* (see Table 8). *Parental education* and *household income*, were averaged, yielding a composite scale, *socioeconomic status.*

**Media use at Wave 1.** To measure overall media use at Wave 1, I computed the total weekly hours media was used, using the sum of 4 in-home questionnaire items from Wave 1, which represent the self-reported number of hours different types of media were used each week (i.e., television, videos, video/computer games, radio). To address the nonnormality (i.e., positive skewedness) of the reported media use data, the natural log of this sum was computed, resulting in a composite scale, *media use* (see Table 9).

**Outcome Variables**

Survival analysis aims to analyze the timing of an event and addresses questions regarding whether and when the event of interest takes place (Guo, 2010). The dependent variable of survival analysis contains two pieces of information: (1) a continuous variable representing the timing of a participant's change process or event; and (2) a dichotomous change-of-state variable, often referred to as the event or censoring code. Survival analysis enables researchers to manage a common issue of incomplete data, called censoring. When exact event times are known for only a portion of study participants, Guo notes, survival analysis can accommodate right-hand censoring – situations in which the event of interest has not occurred by the end of data collection – and random censoring – a situation in which both an origin or entry into observation, and ending point or termination of observation is known, but occurs for reasons other than the event of interest (e.g., participants drop from the study, etc.).

In each of the analyses, event of interest is the initiation of each of three sex behaviors: (1) vaginal penetrative intercourse, (2) receiving or giving oral sex, and (3) anal sex. The time-to-event variable measures either the age at which the sex behavior was initiated, or at which the participant was censored. The event code distinguishes those who initiated a sex behavior (code = "1") from others who were right-hand or randomly censored (code = "0"). The Cox proportional hazard model calculates the hazard of sexual initiation at each time point given for everyone still eligible to initiate sex because (1) they reported not having done so previously and (2) they remain in the sample. In my study, the timing of initiation of sex behavior is measured using the reported time from birth, or age at sexual initiation. Below is a description of how the three outcome variables were operationalized and measured for this study.

**Age at first vaginal sex.** To compute *age at first vaginal sex*, I used data from across all four waves. At Waves 1 and 2, participants reported the month and year of first sexual intercourse. Using this date and participant's month and year of birth, I computed the *age at first vaginal sex* in years. At Waves 3 and 4, participants reported their age at first sexual intercourse. If not reported in Waves 1 or 2, then this value was used. For participants who reported a non-event (i.e., not having initiated vaginal sex), the participant age at which the non-event was the last reported was the value used for this variable.

**Age at first oral sex.** To compute *age at first oral sex*, I used data from Waves 3 and 4. At Wave 3 participants reported the date that oral sex was first received for up to twenty relationships. Using earliest of those dates and each participant's date of birth, I computed *age at first oral sex*. At Wave 4, participants reported the age in years of their first oral sexual intercourse. The earliest age of first oral sex reported between Waves 3 and 4 was used for the final age at first oral sex variable. For participants who reported a non-event (i.e., not having initiated oral sex), the participant age at which the non-event was the last reported was the value used for this variable.

**Age at first anal sex.** To compute the *age at first anal sex*, I used data from Wave 4, when participants reported the age in years of their first anal sexual intercourse. For participants who reported a non-event (i.e., not having initiated anal sex), the participant age at which the non-event was the reported (Wave 4) was the value used for this variable.

## Analysis Plan

The Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corporation, 2017) was used to perform quantitative statistical analysis. Data were unweighted, as the use of

statistical sample weights feature was not available using SPSS. Univariate (e.g., %, mean, standard deviation) and bivariate analyses were performed in order to describe and characterize key predictor variables. Then, I conducted hierarchical survival analyses using the Cox proportional hazards model to examine the relationship between adolescent media use and the timing of initiation of vaginal, oral, and anal sexual intercourse. The Cox proportional hazard model is a semi-parametric, distribution-free model that does not require assumptions about the underlying distribution of survival times (Guo, 2010). Rather, the proportional hazards assumption is that "the hazard for any individual in a sample is a fixed proportion of the hazard for any other individual, and that the ratio of the two hazards is constant over time" (p. 75). With the partial likelihood estimation method deployed in a Cox model, the likelihood function is solely expressed by the coefficients to be estimated (e.g., $\beta$) and the predictors.

While often debated and suggested that intersectional approaches might be best applied in qualitative research, a small but burgeoning body of scholarship offers support for the application and applicability of intersectional approaches in quantitative research (Bowleg, 2017; Gikiouleka, Huijts, Beckfield, & Bambra, 2018). Quantitative intersectionality approaches offer direction for measuring and practicing intersectionality, whereby social identities, the intersection of identities, and the implied social contexts shaping the experiences of people who embody them are theorized and quantitatively modeled (Bowleg, 2012; Bowleg, 2008). Rather than simply consider the independent, additive effects of social and demographic factors, quantitative intersectional approaches include "an examination and comparison of additive, multiplicative, and intersectional effects" (Else-Quest & Hyde, 2016, p. 162). For this study, I conducted hierarchical survival analysis using the Cox proportional hazard models to examine main effects of media use, race, gender, and SES, and interactions among these variables in the

prediction of sexual initiation. Then, following an intersectional approach, I stratify the sample into six race by gender groups to examine the association of media use with sexual initiation within each group.

To explore the main predictor variable of interest (Model 1), *media use* at Wave 1 was entered in the model predicting timing of sexual initiation. Model 2 examined the additive or simple main effects of *media use* and covariates – *race*, *gender*, and *SES*. To explore the potential moderating effects of gender on the relationship between media use and sexual initiation, Model 3 examined the multiplicative effects of a gender-by-media use (e.g., gender is the first-order moderator variable) two-way interaction. Here, I explored whether associations between media use and the timing of sexual initiation differed between female and male participants. Model 4 included the additional multiplicative effects of race-by-media use (i.e., if the associations between media use and timing of sexual initiation differ by race) and race-by-gender (i.e., if the associations between gender and timing of sexual initiation differ by race) two-way interactions. Model 5 explored a potential three-way interaction between race, gender, and media use, whereby *media use* was the "focal independent variable", *gender* was the "first-order moderator variable", and *race* was the "second-order moderator variable" (Jaccard & Turrisi, 2003). Here, I explored whether the gender differences in associations between media use and initiation differed by race. Then, data were stratified by race-by-gender subgroups, and I conducted simple main effect models examining media use as a predictor of sexual initiation, controlling for SES.

To determine whether each estimated Cox model fitted the data to an acceptable degree, model Wald chi-square tests were performed at the level of $p<.05$. For main effects models (Models 1, 2, and stratified models), relative risks or "hazard ratios" were used to examine the

difference in timing of sexual initiation as a function of each independent variable, all others held constant; *p* values and 95% confidence intervals were also presented (Guo, 2010). To test the significance of statistical interactions and multiplicative effects (Models 3, 4, and 5), beta coefficients of interaction terms were examined, at the level of $p<.05$. The strength of interactions (Model 3 and 5) in standardized terms were determined by using the beta coefficients of the interaction terms and the change in $X^2$ (due to the addition of interaction terms of interest) (Jaccard & Turrisi, 2003). To make the interpretation of interactions easier, *media use* was grand mean-centered. Survivor functions, stratified by race-by-gender subgroup, were rendered (see Appendix A, B, and C for main effects from data stratified by race-by-gender subgroups).

## Results

The study sample for each of the three sets of analyses were similar – N = 2,086 for vaginal sex, N = 2,037 for oral sex, and N = 2,066 for anal sex. All participants who were included in oral and anal sex analyses were also included in the vaginal sex sample.

### Media Use

On average, participants in these analyses used 39.2 ± 30.8 hours of media use per week. The average hours of weekly media use ranged from 33.8 (White females) to 47.8 hours (Black males) across race-by-gender subgroups. On average, male participants had significantly higher weekly media use than did females, and Black and Hispanic participants higher than White[9]. For

[9] In order to determine if, at Wave 1, *media use* differed for participants by race or gender, Kruskal-Wallis H tests were performed, comparing the means of the non-normally distributed data. Results showed that there was a statistically significant difference in weekly hours of media

reference, Table 9 shows the average weekly hours of media use for participants included in the vaginal sex sample (the largest sample) by race, gender, and at the intersections of these two factors.

Table 9
*Media Use by Race and Gender – Vaginal Intercourse Sample (N = 2,086)*

| | Media Use (hours per week) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>(n) | Male<br>Mean *(SD)*<br>(n) | Total<br>Mean *(SD)*<br>(n) |
| Race | | | |
| White | 33.8 *(26.3)*<br>(n = 611) | 37.9 *(30.6)*<br>(n = 822) | 36.2 *(28.9)*<br>(n = 1,433) |
| Black | 46.2 *(36.6)*<br>(n = 239) | 47.8 *(32.9)*<br>(n = 223) | 47.0 *(34.8)*<br>(n = 462) |
| Hispanic | 40.0 *(28.5)*<br>(n = 82) | 45.0 *(31.1)*<br>(n = 109) | 42.9 *(30.1)*<br>(n = 191) |
| Total | 37.6 *(29.9)*<br>(n = 932) | 40.5 *(31.4)*<br>(n = 1,154) | 39.2 *(30.8)*<br>(n = 2,086) |

**Vaginal Sex Initiation**

Of the 2,086 participants included in these analyses, 2,027 participants (~97%) reported having initiated vaginal sexual intercourse and had an average age of vaginal sex initiation of 16.9 ± 3.1 years old. Table 10 shows the number, percentage, and average age of vaginal sex

used between racial groups, $\chi^2(2) = 45.3$, $p < .001$. A series of Mann-Whitney U tests indicated that weekly hours of media used were statistically significantly greater for Black participants in comparison to White, $U = 265{,}714$, $p<.001$; and for Hispanic participants in comparison to White, $U = 117{,}532$, $p = .002$. A Kruskal-Wallis H test also showed that male participants had statistically significantly higher number of weekly hours of media use than did female participants, $\chi^2(1) = 7.4$, $p = .007$.

initiation of participants (who had initiated vaginal sex by Wave 4) by race and gender. The average age of vaginal sex initiation ranged from 14.9 (Black males) to 17.6 years old (White females) across race-by-gender subgroups. Non-parametric statistical analyses indicated that, on average, male participants were significantly younger than females at vaginal sex initiation, and Black participants younger than both White and Hispanic[10].

Table 10
*Age at Vaginal Sex Initiation by Race and Gender Among Youth who had Initiated Behavior by Wave 4*

| | Age (in years) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>*%* (n) | Male<br>Mean *(SD)*<br>*%* (n) | Total<br>Mean *(SD)*<br>*%* (n) |
| Race | | | |
| White | 17.6 *(2.8)*<br>*95.2* (582) | 17.0 *(3.1)*<br>*97.8* (804) | 17.23 *(3.0)*<br>*96.7* (1,386) |
| Black | 16.9 *(2.8)*<br>*98.3* (235) | 14.9 *(3.3)*<br>*98.2* (219) | 15.9 *(3.2)*<br>*98.3* (454) |
| Hispanic | 17.5 *(2.5)*<br>*95.1* (78) | 16.6 *(3.1)*<br>*100.0* (109) | 17.0 *(2.9)*<br>*97.9* (187) |
| Total | 17.4 *(2.8)*<br>*96.0* (895) | 16.6 *(3.3)*<br>*98.1* (1,132) | 16.97 *(3.13)*<br>*97.2* (2,027) |

[10] In order to determine if the age at vaginal sex initiation differed for these participants by race or gender, Kruskal-Wallis H tests were performed to compare means of the non-normally distributed data. Results showed that there was a statistically significant difference in age at vaginal sex initiation between racial groups, $\chi^2(2) = 61.8$, $p<.001$, with a mean rank age at vaginal sex initiation of 1072.8 for White, 128.33 for Black, 825.1, and 1,036.9 for Hispanic participants. A series of Mann-Whitney U tests indicated that age at vaginal sex initiation was statistically significantly younger for Black participants in comparison to White, $U =$ 237,849.5, $p < .001$; and for Black participants in comparison to Hispanic, $U = 33{,}443.5$, $p <$ .001. A Kruskal-Wallis H test also showed that males had a significantly younger age at vaginal sex initiation than female participants, $\chi^2(1) = 33.2$, $p < .001$.

Table 11 displays the results of the hierarchical Cox proportional hazards models predicting the timing of vaginal sex initiation. In model 1, higher *media use* at Wave 1 was associated with earlier vaginal sex initiation. In model 2, which examined the additive simple main effects of race, gender, SES and media use, Black *race*, higher *media use,* and lower *SES* predicted earlier vaginal sex initiation, while female *gender* predicted later initiation. Model 3 examined the interactive effects of gender and media use – that is, the extent to which gender moderated the relationship between media use and vaginal sex initiation. The two-way interaction of gender and media use was not statistically significant. Model 4 included additional two-way interactions, including the statistically significant interaction between race and gender. However, the addition of three-way interaction of race, gender, and media use (model 5) yielded no significant change in the model $X^2$.

Table 11
*Hierarchical Models of Relative Risks of Vaginal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 1 - Univariate (unadjusted)* | | | |
| Media use | .19 | .03 | 39.7 | .00 | 1.21 | [1.14-1.29] |
| $\Delta X^2$ | 40.07** | | | | | |
| *df* | 1 | | | | | |
| | | | *Model 2 – Multivariate (adjusted)* | | | |
| Media use | .12 | .03 | 15.46 | .00 | 1.13 | [1.06-1.20] |
| Black | .35 | .06 | 40.21 | .00 | 1.42 | [1.28-1.59] |
| Hispanic | -.11 | .08 | 1.79 | .18 | .90 | [.77-1.05] |
| Female | -.27 | .05 | 35.68 | .00 | .76 | [.70-.83] |
| SES | -.15 | .02 | 87.47 | .00 | .86 | [.83-.89] |
| $\Delta X^2$ | 150.19** | | | | | |
| *df* | 5 | | | | | |

Table 11
*Hierarchical Models of Relative Risks of Vaginal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| *Model 3 - Multivariate with gender x media use (GxM) interaction* | | | | | | |
| Media use | .14 | .04 | 10.67 | .00 | 1.15 | [1.06-1.25] |
| Race (Black) | .36 | .06 | 40.54 | .00 | 1.43 | [1.28-1.59] |
| Race (Hispanic) | -.11 | .08 | 1.83 | .18 | .89 | [.76-1.05] |
| Gender (Female) | -.27 | .05 | 35.68 | .00 | .76 | [.70-.83] |
| SES | -.15 | .02 | 87.31 | .00 | .86 | [.83-.89] |
| G (female) x M | -.04 | .06 | .34 | .56 | .97 | [.86-1.09] |
| $\Delta X^2$ | .34 | | | | | |
| *df* | 6 | | | | | |
| *Model 4 - Multivariate with all two-way interactions GxM, RxM, RxG* | | | | | | |
| Media use | .15 | .05 | 9.82 | .00 | 1.16 | [1.06-1.27] |
| Race (Black) | .53 | .08 | 8.62 | .00 | 1.71 | [1.47-1.99] |
| Race (Hispanic) | .03 | .11 | .10 | .00 | .86 | [.83-.89] |
| Gender (Female) | -.16 | .06 | 8.62 | .00 | .85 | [.76-.95] |
| SES | -.15 | .02 | 89.65 | .00 | .86 | [.83-.89] |
| G (female) x M | .01 | .06 | .02 | .89 | 1.01 | [.89-1.14] |
| R (Black) x M | -.12 | .08 | 2.43 | .12 | .89 | [.77-1.03] |
| R (Hispanic) x M | .00 | .11 | .00 | .99 | 1.00 | [.80-1.25] |
| G (female) x R (Black) | -.33 | .11 | 8.98 | .00 | .72 | [.58-.89] |
| G (female) x R (Hispanic) | -.34 | .16 | 4.56 | .03 | .71 | [.52-.97] |
| $\Delta X^2$ | 14.02* | | | | | |
| *df* | 10 | | | | | |
| *Model 5 – Three-way interaction – R x G x M* | | | | | | |
| Media use | .14 | .05 | 7.60 | .01 | 1.15 | [1.04-1.27] |
| Race (Black) | .52 | .08 | 42.59 | .00 | 1.68 | [1.44-1.96] |
| Race (Hispanic) | .06 | .11 | .29 | .59 | 1.06 | [.86-1.30] |
| Gender (Female) | -.16 | .06 | 8.48 | .00 | .85 | [.77-.95] |
| SES | -.16 | .02 | 92.16 | .00 | .86 | [.83-.88] |
| G (female) x M | .03 | .08 | .11 | .75 | 1.03 | [.88-1.19] |
| R (Black) x M | -.02 | .11 | .04 | .85 | .98 | [.79-1.21] |
| R (Hispanic) x M | -.13 | .15 | .77 | .38 | .88 | [.65-1.18] |
| G (female) x R (Black) | -.30 | .11 | 7.34 | .01 | .73 | [.59-.92] |
| G (female) x R (Hispanic) | -.37 | .16 | 5.42 | .02 | .69 | [.50-.94] |
| G (female) x R (Black) x M | -.18 | .15 | 1.34 | .25 | .84 | [.63-1.13] |
| G (female) x R (Hispanic) x M | .28 | .22 | 1.57 | .21 | 1.32 | [.85-2.04] |
| $\Delta X^2$ | 3.51 | | | | | |
| *df* | 12 | | | | | |
| $\Sigma X^2$ | 223.12** | | | | | |

*$p < .05$. **$p < .01$.

Figure 5 depicts cumulative survivor curves, stratified into race-by-gender subgroups and plotted at the means of *media use* and *SES.* Appendix A shows models of main effects predicting timing of vaginal sex initiation as a function of *media use* and *SES* using disaggregate data for each race-by-gender subgroup. In these models, higher *media use* predicted earlier initiation for White males and females only. Lower *SES* predicted earlier initiation for White and Black males and females.

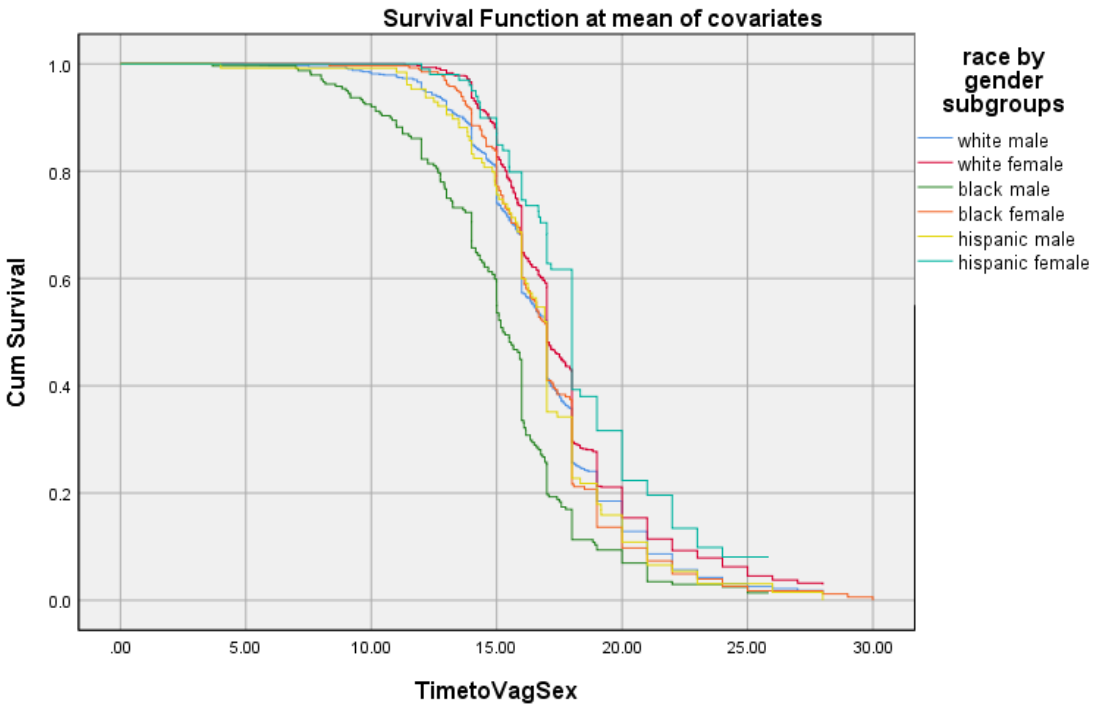


*Figure 5*. Cumulative Survival Function (Vaginal Sex), Stratified by Race-by-Gender Subgroups

**Oral Sex Initiation**

Of the 2,037 participants included in these analyses, 1,904 participants (~93%) reported having initiated oral sex and had an average age of oral sex initiation of 17.6 ± 3.1 years old. Table 12 shows the number, percentage, and average age of oral sex initiation of participants (who

initiated oral sex by Wave 4) by race and gender. The average age of oral sex initiation ranged from 16.9 (Hispanic males) to 19.4 years old (Black females) across race-by-gender subgroups. Non-parametric statistical analyses indicated that, on average, male participants were significantly younger than females at oral sex initiation, and Black participants older than both White and Hispanic[11].

Table 12
*Average Age at Oral Sex Initiation by Race and Gender Among Youth Who Had Initiated Oral Sex by Wave 4*

| | Age (in years) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>*%* (n) | Male<br>Mean *(SD)*<br>*%* (n) | Total<br>Mean *(SD)*<br>*%* (n) |
| Race | | | |
| White | 18.0 *(2.9)*<br>*93.4* (559) | 17.0 *(3.0)*<br>*96.8* (787) | 17.4 *(3.0)*<br>*95.4* (1,346) |
| Black | 19.4 *(3.4)*<br>*83.7* (190) | 17.5 *(3.2)*<br>*93.9* (199) | 18.4 *(3.4)*<br>*88.6* (389) |
| Hispanic | 18.6 *(2.7)*<br>*85.0* (68) | 16.9 *(2.8)*<br>*94.4* (101) | 17.6 *(2.9)*<br>*90.4* (169) |
| Total | 18.4 *(3.1)*<br>*90.2* (817) | 17.1 *(3.0)*<br>*96.0* (1,087) | 17.6 *(3.1)*<br>*93.5* (1,904) |

[11] In order to determine if the age at oral sex initiation differed for these participants by race or gender, Kruskal-Wallis H tests were performed to compare means of the non-normally distributed data. Results showed that there was a statistically significant difference in age at oral sex initiation between racial groups, $\chi^2(2) = 50.5$, $p<.001$, with a mean rank age at oral sex initiation of 900.1 for White, 128.33 for Black, 1,022.8, and 977.9 for Hispanic participants. A series of Mann-Whitney U tests indicated that age at oral sex initiation was statistically significantly younger for White participants in comparison to Black, $U = 200{,}652.5$, $p < .001$; and for Hispanic participants in comparison to Black, $U = 27{,}765.5$, $p < .01$. A Kruskal-Wallis H test also showed that males had a significantly younger age at oral sex initiation than female participants, $\chi^2(1) = 99.8$, $p < .001$.

Table 13 displays the results of the hierarchical Cox proportional hazards models predicting the timing of oral sex initiation. In model 1, *media use* at Wave 1 did not predict oral sex initiation. In model 2, which examined the additive simple main effects of race, gender, SES and media use, higher *media use* predicted earlier oral sex initiation, while Black and Hispanic *race* and female *gender* predicted later initiation. Model 3 examined the interactive effects of gender and media use – that is, the extent to which gender moderated the relationship between media use and oral sex initiation. Model 4 included additional two-way interactions, including the statistically significant interaction between race and gender, and model 5 added a three-way interaction of race, gender, and media use. None of the two-way or three-way interactions were statistically significant.

Table 13
*Hierarchical Models of Relative Risks of Oral Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 1 - Univariate (unadjusted)* | | | |
| Media use | .05 | .03 | 2.44 | .12 | 1.05 | [.99-1.11] |
| $\Delta X^2$ | 2.44 | | | | | |
| *df* | 1 | | | | | |
| | | | *Model 2 – Multivariate (adjusted)* | | | |
| Media use | .08 | .03 | 6.51 | .01 | 1.08 | [1.02-1.15] |
| Black | -.38 | .06 | 40.42 | .00 | .69 | [.61-.77] |
| Hispanic | -.21 | .08 | 5.93 | .02 | .82 | [.69-.96] |
| Female | -.38 | .05 | 66.73 | .00 | .68 | [.62-.75] |
| SES | .01 | .02 | .42 | .52 | 1.01 | [.98-1.05] |
| $\Delta X^2$ | 129.01** | | | | | |
| *df* | 5 | | | | | |
| | | | *Model 3 - Multivariate with gender x media use (GxM) interaction* | | | |
| Media use | .13 | .04 | 8.54 | .00 | 1.13 | [1.04-1.23] |
| Race (Black) | -.38 | .06 | 39.90 | .00 | .69 | [.61-.77] |
| Race (Hispanic) | -.20 | .08 | 5.90 | .02 | .82 | [.69-.96] |
| Gender (Female) | -.38 | .05 | 66.82 | .00 | .68 | [.62-.75] |
| SES | .01 | .02 | .43 | .51 | 1.01 | [.98-1.05] |
| G (female) x M | -.10 | .06 | 2.42 | .12 | .91 | [.80-1.03] |
| $\Delta X^2$ | 2.42 | | | | | |
| *df* | 6 | | | | | |

Table 13
*Hierarchical Models of Relative Risks of Oral Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| *Model 4 - Multivariate with all two-way interactions GxM, RxM, RxG* | | | | | | |
| Media use | .14 | .05 | 8.87 | .00 | 1.15 | [1.05-1.27] |
| Race (Black) | -.26 | .08 | 10.00 | .00 | .77 | [.66-.91] |
| Race (Hispanic) | -.11 | .11 | 1.00 | .32 | .90 | [.73-1.11] |
| Gender (Female) | -.31 | .06 | 31.55 | .00 | .73 | [.66-.82] |
| SES | .01 | .02 | .38 | .54 | 1.01 | [.98-1.04] |
| G (female) x M | -.07 | .06 | 1.30 | .25 | .93 | [.82-1.05] |
| R (Black) x M | -.10 | .08 | 1.61 | .20 | .91 | [.78-1.05] |
| R (Hispanic) x M | -.06 | .11 | .27 | .60 | .94 | [.76-1.17] |
| G (female) x R (Black) | -.23 | .12 | 3.83 | .05 | .80 | [.63-1.00] |
| G (female) x R (Hispanic) | -.23 | .17 | 1.93 | .17 | .79 | [.57-1.10] |
| $\Delta X^2$ | 6.37 | | | | | |
| *df* | 10 | | | | | |
| *Model 5 – Three-way interaction – R x G x M* | | | | | | |
| Media use | .13 | .05 | 6.19 | .01 | 1.14 | [1.03-1.26] |
| Race (Black) | -.26 | .08 | 9.85 | .00 | .77 | [.66-.91] |
| Race (Hispanic) | -.12 | .11 | 1.18 | .28 | .88 | [.72-1.10] |
| Gender (Female) | -.31 | .06 | 31.05 | .00 | .73 | [.66-.82] |
| SES | .01 | .02 | .47 | .50 | 1.01 | [.98-1.05] |
| G (female) x M | -.04 | .08 | .29 | .59 | .96 | [.83-1.11] |
| R (Black) x M | -.07 | .11 | .48 | .49 | .93 | [.75-1.15] |
| R (Hispanic) x M | .04 | .15 | .07 | .79 | 1.04 | [.77-1.39] |
| G (female) x R (Black) | -.22 | .12 | 3.73 | .05 | .80 | [.63-1.00] |
| G (female) x R (Hispanic) | -.22 | .17 | 1.70 | .19 | .80 | [.58-1.12] |
| G (female) x R (Black) x M | -.05 | .15 | .10 | .76 | .95 | [.71-1.28] |
| G (female) x R (Hispanic) x M | -.23 | .23 | 1.00 | .32 | .80 | [.51-1.24] |
| $\Delta X^2$ | 1.03 | | | | | |
| *df* | 12 | | | | | |
| $\Sigma X^2$ | 136.50** | | | | | |

*$p < .05$. **$p < .01$.

Figure 6 depicts cumulative survivor curves for oral sex initiation, stratified by race-by-gender subgroup and plotted at the means of *media use* and *SES.* Appendix B shows models of main effects predicting timing of oral sex initiation as a function of *media use* and *SES* at

intersections of race and gender subgroups. In stratified models, higher *media use* predicted earlier initiation for White males only. Higher *SES* predicted earlier initiation for Black females.

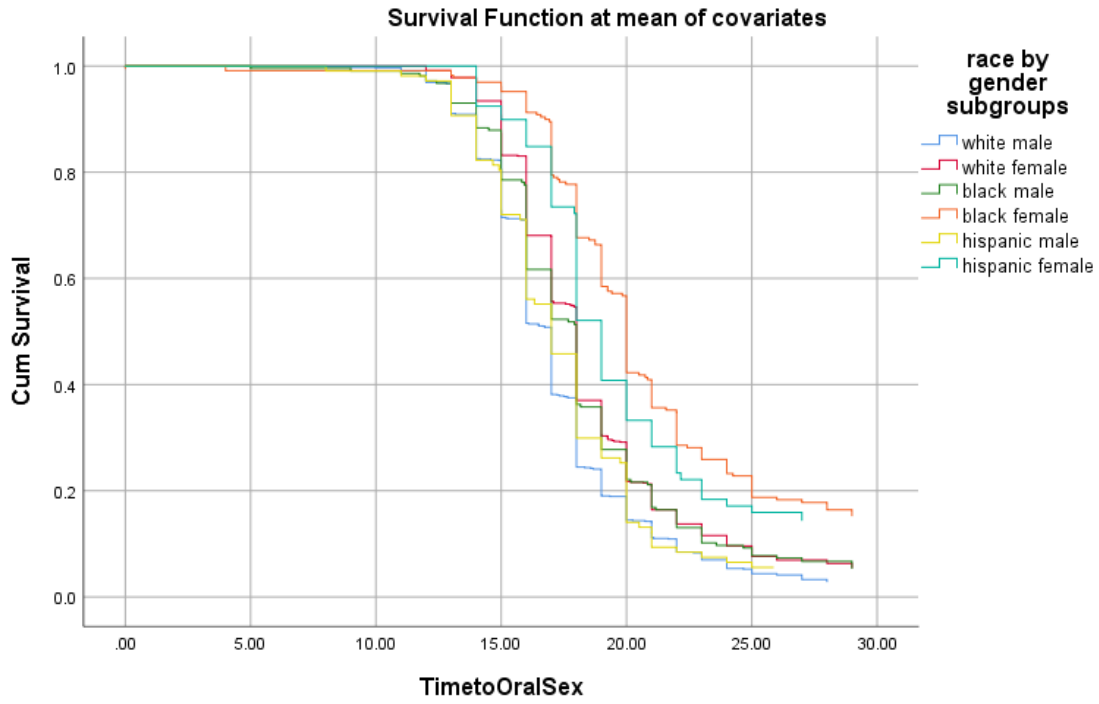


*Figure 6*. Cumulative Survival Function (Oral Sex), Stratified by Race-by-Gender Subgroups

**Anal Sex Initiation**

Of the 2,066 participants included in these analyses, 756 participants (~37%) – a much smaller proportion than initiates of vaginal and oral sex - reported having initiated anal sex and had an average age of anal sex initiation of 21.7 ± 3.7 years old. Table 14 shows the number, percentage, and average age of anal sex initiation of participants who initiated the behavior by Wave 4 by race and gender. The average age of anal sex initiation between race-by-gender subgroups ranged from 20.3 (Hispanic males) to 22.8 years old (Black females). Non-parametric

statistical analyses indicated that, on average, male participants were significantly younger than females at anal sex initiation, and Black participants older than both White and Hispanic[12].

Table 14
*Average Age at Anal Sex Initiation of Participants by Race and Gender Among Youth Who Initiated the Behavior by Wave 4*

| | Age (in years) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>*%* (n) | Male<br>Mean *(SD)*<br>*%* (n) | Total<br>Mean *(SD)*<br>*%* (n) |
| Race | | | |
| White | 22.3 *(3.5)*<br>*31.7* (191) | 21.3 *(3.5)*<br>*43.6* (357) | 21.7 *(3.5)*<br>*38.5* (548) |
| Black | 22.8 *(2.8)*<br>*23.7* (56) | 21.7 *(4.6)*<br>*36.1* (79) | 22.1 *(3.9)*<br>*29.7* (135) |
| Hispanic | 21.9 *(4.0)*<br>*31.7* (26) | 20.3 *(4.7)*<br>*43.9* (47) | 20.8 *(4.5)*<br>*38.6* (73) |
| Total | 22.3 *(3.4)*<br>*29.6* (273) | 21.3 *(3.8)*<br>*42.2* (483) | 21.7 *(3.7)*<br>*36.6* (756) |

[12] In order to determine if the age at anal sex initiation differed for these participants by race or gender, Kruskal-Wallis H tests were performed to compare means of the non-normally distributed data. Results showed that there was a statistically significant difference in age at anal sex initiation between racial groups, $\chi^2(2) = 7.6$, $p<.05$, with a mean rank age at anal sex initiation of 373.7 for White, 128.33 for Black, 419.7, and 338.4 for Hispanic participants. A series of Mann-Whitney U tests indicated that age at anal sex initiation was statistically significantly younger for White participants in comparison to Black, $U = 32{,}457.5$, $p < .05$; and for Hispanic participants in comparison to Black, $U = 3{,}903.0$, $p < .05$. A Kruskal-Wallis H test also showed that males had a significantly younger age at anal sex initiation than female participants, $\chi^2(1) = 11.8$, $p < .01$.

Table 15 displays the results of the hierarchical Cox proportional hazards models predicting the timing of anal sex initiation. In model 1, *media use* at Wave 1 did not predict initiation. In model 2, which examined the additive simple main effects of race, gender, SES and media use, Black *race* and female *gender* predicted later initiation. Model 3 examined the interactive effects of gender and media use – that is, the extent to which gender moderated the relationship between media use and anal sex initiation. Model 4 included additional two-way interactions, including the statistically significant interaction between race and gender, and model 5 added a three-way interaction of race, gender, and media use. None of the two-way or three-way interactions were statistically significant in predicting anal sex initiation.

Table 15
*Hierarchical Models of Relative Risks of Anal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 1 - Univariate (unadjusted)* | | | |
| Media use | .00 | .05 | .00 | .98 | 1.00 | [.91-1.10] |
| $\Delta X^2$ | .00 | | | | | |
| *df* | 1 | | | | | |
| | | | *Model 2 – Multivariate (adjusted)* | | | |
| Media use | .00 | .05 | .00 | 1.00 | 1.00 | [.90-1.10] |
| Black | -.30 | .10 | 9.44 | .00 | .74 | [.61-.90] |
| Hispanic | .01 | .13 | .01 | .94 | 1.01 | [.79-1.30] |
| Female | -.44 | .08 | 33.34 | .00 | .64 | [.56-.75] |
| SES | -.03 | .03 | .99 | .32 | .97 | [.92-1.03] |
| $\Delta X^2$ | 48.17** | | | | | |
| *df* | 5 | | | | | |
| | | | *Model 3 - Multivariate with gender x media use (GxM) interaction* | | | |
| Media use | .05 | .06 | .55 | .46 | 1.05 | [.93-1.19] |
| Race (Black) | -.30 | .10 | 9.29 | .00 | .74 | [.61-.90] |
| Race (Hispanic) | .01 | .13 | .01 | .95 | 1.01 | [.79-1.30] |
| Gender (Female) | -.44 | .08 | 33.59 | .00 | .64 | [.55-.75] |
| SES | -.03 | .03 | .96 | .33 | .97 | [.92-1.03] |
| G (female) x M | -.12 | .10 | 1.48 | .22 | .88 | [.73-1.08] |
| $\Delta X^2$ | 1.48 | | | | | |
| *df* | 6 | | | | | |

Table 15
*Hierarchical Models of Relative Risks of Anal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| *Model 4 - Multivariate with all two-way interactions GxM, RxM, RxG* | | | | | | |
| Media use | .02 | .07 | .09 | .76 | 1.02 | [.89-1.17] |
| Race (Black) | -.28 | .13 | 4.72 | .03 | .76 | [.59-.97] |
| Race (Hispanic) | -.03 | .17 | .03 | .85 | .97 | [.70-1.34] |
| Gender (Female) | -.44 | .09 | 22.95 | .00 | .65 | [.54-.77] |
| SES | -.03 | .03 | .93 | .34 | .97 | [.92-1.03] |
| G (female) x M | -.12 | .10 | 1.37 | .24 | .89 | [.73-1.08] |
| R (Black) x M | .01 | .13 | .01 | .94 | 1.01 | [.79-1.30] |
| R (Hispanic) x M | .23 | .17 | 1.71 | .19 | 1.25 | [.89-1.76] |
| G (female) x R (Black) | -.04 | .20 | .04 | .84 | .96 | [.65-1.42] |
| G (female) x R (Hispanic) | .02 | .27 | .01 | .95 | 1.02 | [.61-1.71] |
| $\Delta X^2$ | 1.83 | | | | | |
| *df* | 10 | | | | | |
| *Model 5 – Three-way interaction – R x G x M* | | | | | | |
| Media use | .05 | .07 | .44 | .51 | 1.05 | [.91-1.22] |
| Race (Black) | -.28 | .13 | 4.65 | .03 | .76 | [.59-.98] |
| Race (Hispanic)_ | .02 | .16 | .01 | .92 | 1.02 | [.74-1.39] |
| Gender (Female) | -.45 | .09 | 23.53 | .00 | .64 | [.54-.77] |
| SES | -.03 | .03 | 1.19 | .27 | .97 | [.92-1.02] |
| G (female) x M | -.20 | .12 | 2.66 | .10 | .82 | [.65-1.04] |
| R (Black) x M | -.02 | .17 | .02 | .89 | .98 | [.71-1.35] |
| R (Hispanic) x M | -.01 | .21 | .00 | .97 | .99 | [.66-1.49] |
| G (female) x R (Black) | -.03 | .20 | .03 | .87 | .97 | [.65-1.43] |
| G (female) x R (Hispanic) | -.09 | .28 | .11 | .74 | .91 | [.53-1.56] |
| G (female) x R (Black) x M | .09 | .26 | .12 | .73 | 1.09 | [.66-1.83] |
| G (female) x R (Hispanic) x M | .65 | .36 | 3.27 | .07 | 1.92 | [.95-3.88] |
| $\Delta X^2$ | 3.30 | | | | | |
| *df* | 12 | | | | | |
| $\Sigma X^2$ | 52.62** | | | | | |

*$p < .05$. **$p < .01$.

Figure 7 depicts cumulative survivor curves for anal sex initiation, stratified by race-by-gender subgroup and plotted at the means of *media use* and *SES.* Appendix C shows models of main effects predicting timing of anal sex initiation as a function of *media use* and *SES* at

intersections of race-by-gender subgroups. In stratified models, neither media use nor SES were significantly associated with the timing of anal sex initiation for any of the race-by-gender subgroups.

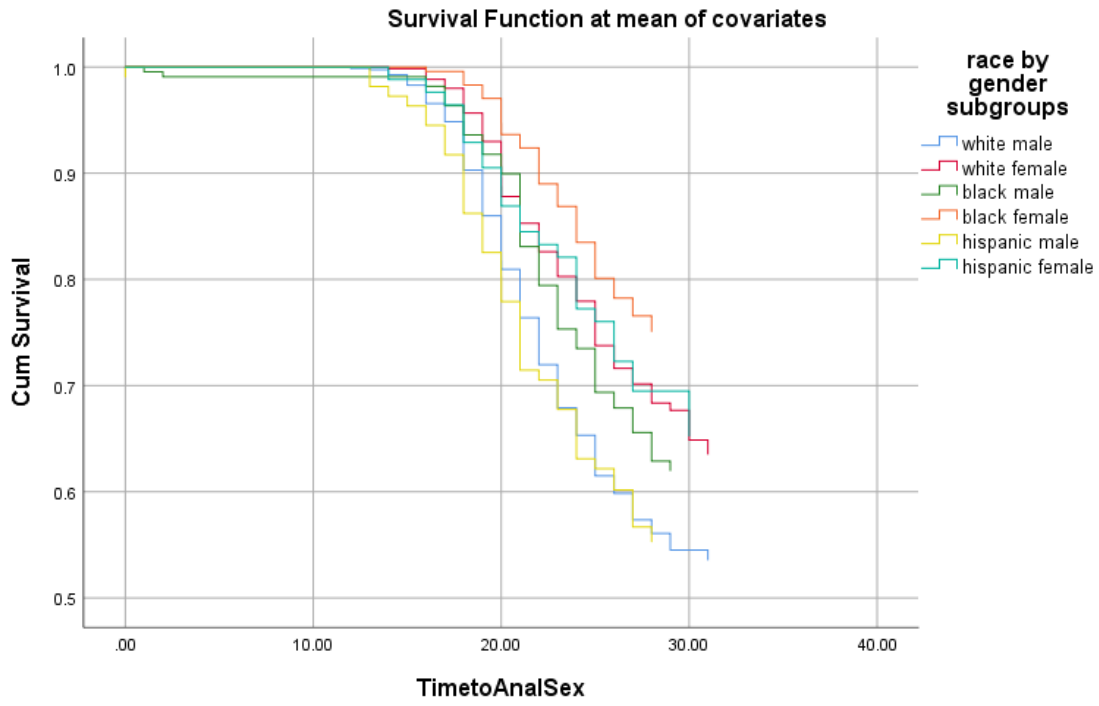


*Figure 7.* Cumulative Survival Function (Anal Sex), Stratified by Race-by-Gender Subgroups

**Race, Gender, and Socioeconomic Status**

In the multivariate models, race, gender, and SES were included as covariates. The relationship between each of these factors and sexual initiation varied by sex behavior. While race was a significant factor across sex behaviors, the statistical significance of each racial group's difference, and the direction of the relationship depended on the type of sex behavior (see Tables 11, 13, and 15). For example, in adjusted models, Black race was associated with significantly earlier initiation of vaginal sex and later oral and anal sex initiation. Being Hispanic was associated with later oral sex initiation.

Gender was a significant factor in adjusted models for all three sex behaviors (see Tables 11, 13, and 15). Female gender was associated with later initiation across all three sex behaviors. SES was significant only in the adjusted models for vaginal sex initiation. Having a higher SES predicted later vaginal sex initiation.

### Interactions and Intersections

For each sex behavior, multivariate models, adjusted for race, gender, SES, and age, also included gender-by-media use, race-by-gender, race-by-media use, and race-by-gender-by-media use interaction terms (see Tables 11, 13, and 15). Only one significant interaction was detected in the models – a race-by-gender interaction predicting vaginal sex initiation. To explore the relationship between media use and sexual initiation at intersections of race and gender, data were disaggregated and separate survival analyses were performed (see Appendix A, B, and C). Cox proportional hazards regression analyses were conducted for each of the following race-by-gender subgroups: 1) White males, 2) White females, 3) Black males, 4) Black females, 5) Hispanic males, and 6) Hispanic females. For White males and White females only, higher media use was associated with a statistically significant earlier vaginal sex initiation. For White and Black males and females, higher SES was associated with later vaginal sex initiation. White males' higher media use and Black females' higher SES were associated with earlier oral sex initiation.

## Discussion

Findings from longitudinal analyses in this study showed that, for some participants, adolescent media use was significantly associated with vaginal and oral, but not anal sex

initiation. Using higher amounts of media during adolescence was associated with earlier vaginal sex initiation. When race, gender, and socioeconomic status were also considered, media use was still independently associated with vaginal and oral sex initiation. To date, there is a paucity of research that examines factors related to adolescent initiation of diverse sexual behaviors, such as oral and anal sex initiation; even less is known about the role of media as a potential influence on sexual initiation and behavior. These analyses help to clarify the roles of media use, race, gender and SES predicting sexual initiation. In each of the analyses, for example, female participants on average and within each racial group, initiated each sex behavior at a significantly older age than did males. However, the direction, strength, and significance of the associations between race and the timing of sexual initiation varied across sex behaviors. Black participants had a significantly earlier vaginal sex initiation than White participants in adjusted models, but significantly later oral and anal sex initiation than White participants. Black females initiated vaginal sex earlier, and oral and anal sex later than did both White and Hispanic females; the same trend was evident among males. These findings of age of sexual initiation in White and Black adolescents and young adults are consistent with those in a previous study examining youth and young adult oral and anal sex initiation (Ompad, et al., 2006). Lastly, adjusted models for this study sample, participants' reported SES in adolescence was a significant factor for predicting vaginal sex initiation, but not the initiation of other sex behaviors. When media use, race, and gender were also considered, a higher SES delayed the timing of vaginal sex initiation.

The findings from my study added to the discourse, aiming to help elucidate the relationship between adolescent media use and the initiation of some sex behaviors by considering the ways in which this relationship might have been moderated by race and gender. What and how much adolescents learn about sex from different informal sources (e.g., parents,

peers, media) varies by race and gender (Bleakley, Khurana, Hennessy, & Ellithorpe, 2018). How media influences the sexual attitudes, beliefs, and in turn, behaviors of adolescents is also determined by the extent to which adolescents view media representations, images, and messages as realistic (Taylor, 2005). In my study, race and gender were independently associated with sexual initiation. But while there were significant differences observed in the level of media use by race and by gender (see Table 10), my findings from the examination of interaction terms did not support the notion that race or gender moderate the relationship between media use and initiation of any of the three sex behaviors. When data were disaggregated by race-by-gender subgroups, media use remained a significant factor only for White males and their initiation of vaginal and oral sex, and for White females and vaginal sex initiation, but not for any other racial-gender subgroups.

Each day, adolescents are exposed to a tremendous amount of media content via multiple conventional media types. According to the *Generation M*$^2$ Kaiser Family Foundation report, youth between the ages 8 to 18 years old are exposed to over 11 hours of content, multitasking between TV content, music/audio, computer, video games, print, and movies (Rideout, Foehr, & Roberts, 2010). In this chapter's analyses, I found that, on average, youth were exposed to a large amount of weekly media content –almost the equivalent of a full-time work week - via multiple conventional media types. Similar to findings in the *Generation M*$^2$ report, Black and Hispanic youth in this study are exposed to substantially more media content than White youth. This notion has implications for how youth may be socialized by media in ways that differentially influence their behavior and development.

Previous longitudinal studies that have explored the influence of media use on sexual initiation have produced inconsistent, and at times, conflicting evidence. Researchers Collins et

al. conducted a longitudinal study involving 1,792 adolescents and found that overall – and to a lesser extent for African American youth – watching sex on TV seems to predict and may hasten adolescent sexual initiation (2004). In another longitudinal study of 1,228 youth, movie sexual exposure during adolescence predicts the age of sexual initiation – both directly and indirectly via changes in sensation seeking. Movie sexual exposure also predicts engagement in risky sexual behaviors – both directly and indirectly via sexual debut (O'Hara, Gibbons, Gerrard, Li, & Sargent, 2012). Brown and colleagues (2006) examined the association between adolescents' sexy media diets (e.g., the frequency of media viewing and frequency of sexy content across media types) and sexual behavior and found that – for White, but not for Black adolescents – exposure to sexy media content (i.e., music, television, movies, magazines), seems to accelerate sexual activity and increase risk of early sexual intercourse, even when other explanatory factors were also considered.

The findings from my dissertation analyses and the studies reported above are consistent with regard to media effects being substantiated among White adolescents, but to a lesser extent if at all among racial minority adolescents. It is plausible in the current analysis that the sample size challenges encountered in race-by-gender stratified analyses yield less precise estimates of the magnitude and significance of race and gender's influence on timing of initiation. Another possibility is that the underlying mechanisms substantively modify the relationship between media use and sexual initiation at intersections of race and gender. For example, it is possible that white males and females are overrepresented in mainstream media in comparison to other racial groups, and that this high representation increases the likelihood of media messages and images to be salient to White adolescent media consumers. In addition, it is plausible for general media use to be linked to the timing of initiation of vaginal sex and not other sex behaviors,

because an overall lack of diversity of representation of sexual imagery in mainstream media outside of heteronormative vaginal penetrative sex references, images, messages, and innuendo. Further, race and gender differences in timing of initiation of various sex behaviors may hint at cultural differences in the endorsement, socialization, and uptake of different types of sex behaviors. While not examine here, these possibilities merit further exploration through future research.

Other studies have considered the possibility that differential selection – a threat to the internal validity of research when individuals are not able to be randomly assigned - may complicate how the timing of sexual initiation is predicted. In the case of differential selection, it is as plausible that individuals who initiate sexual behaviors early may be doing so, not as a function of the influence of socialization through media use. Rather, it may be the case that higher media use and consumption is clustered among sexually active individuals who, through preference or selection, actively seek more sexy media. One study posited this alternative relationship between sex behavior and media use by looking longitudinally at how changes in sex behaviors (i.e., becoming sexually actively) is linked to subsequent changes in sexy media use in teens ages 14 to 16 years old (Hennessy, Bleakley, Fishbein, & Jordan, 2009). The researchers found that changes in exposure to sexy media content is highly associated with changes in sex behavior among White youth, but only modestly, if at all associated among Black youth. In response to the Collins et al. 2004 study, which suggested sexy media exposure hastens sexual initiation, Steinberg and Monahan (2010) applied similar analytical methods (i.e., Cox regressions) to the original study, but also used what was described as a more stringent approach to accounting for differential selection. They concluded that the associations that are found between sexy media exposure and age at sexual initiation are non-significant when

differential selection is accounted for. Overall though, these longitudinal studies and some others that followed after that used similar or the same datasets (Collins, Martino, Elliott, & Miu, 2011) without the ability to support causal claims, reveal significant independent associations between adolescent media use and sexy media consumption and the age of initiation of sexual intercourse and other sexual behaviors.

Other sources of sexual socialization (i.e., family, peers, formal sex education) can have not only independent and direct influence on sexual socialization and behavior, but also may influence the ways in which media is accessed, engaged, and applied in the lives of youth and young adults. For example, research has shown that watching television for two or more hours a day and having a lack of parental regulation of television programming is associated with an increased risk in sexual initiation within a year among youth who perceived strong parental disapproval for sex (Ashby, Arcari, & Edmonson, 2006), which suggests that family processes (i.e., parenting) may mitigate the influence of media on behavior. Media use is but one factor that is associated with the initiation of sex behaviors in youth and young adults. While the findings from this study highlighted how race, gender and SES help explain how media use is related to the timing of sexual initiation, this study is limited in that it does not address how other socializing influences and mechanisms may impact sexual initiation, and how these factors might interact with media use and sexual initiation.

This study relied on retrospective reports in Waves 1 through 4 from participants of the timing of sexual initiation of sexual behaviors. Drawing from socialization and media effects theories in its postulations, my study examined the relationship between adolescent media use and sexual initiation, and for participants who reported initiating sexual behavior prior to Wave 1 when adolescent media use was reported, it was assumed that childhood levels of media use were

largely consistent with adolescent levels and that the claims implied about the role of media use are still valid. The study methods also yielded a drastically reduced study sample, eliminating the possibility of performing analyses that included some groups of participants (e.g., API and AINA participants). For example, while there was a sufficient amount of data for the analyses featuring White, Black, and Hispanic participants, the sample size of Hispanic youth was notably low. Future analyses that aim to more comprehensively and robustly explore adolescent sexual initiation must have the requisite power in order to include as many relevant variables as possible. Sample weights were not used in this analysis, and so the findings of this study are generalizable not to the general population, but rather are descriptive of the samples included in each analysis.

As we move into a more digitally mediated era in American society, it is also becoming increasingly important that the added influence of digital and social media be taken into consideration in examinations of media socialization and adolescent development. While there are decades of research that has been dedicated to examining and understanding the effects of conventional media types, media socialization, and related behavior, much of it has focused on the development of violent or deviant behavior; a relatively small portion of research has focused on media's relationship to the development of sexual behaviors in adolescents. Content analyses of adolescents' "sexual media diets" show that exposure to sexy media, in general, is strongly associated with adolescent sexual activity and intentions to have sex, and to varying degrees by conventional media type (Pardun, L'Engle, & Brown, 2005), but less is known about digital, social, and Internet media, if and how they influence adolescent sexual behaviors. Leading researchers in adolescent sexual health have called for new studies that include younger media audiences, examinations of social and digital media effects, and the processes that might explain

and moderate the effects of these media on behavior (Collins, et al., 2017). While social media is understood to have many potential benefits for youth – such as facilitating socialization and communication, providing enhanced and extended learning opportunities, and improving access to health information – there are also many risks, including exposure to cyberbullying, online harassment, “sexting”, and mental health issues that are a function of social media-related experiences (O'Keeffe, Clarke-Pearson, & Council on Communications and Media, 2011). It is also estimated that nearly half of Internet-using youth are also exposed to Internet-mediated, sexy content in the form of both unwanted and wanted online pornography (Wolak, Mitchell, & Finkelhor, 2007).

## Conclusions

Adolescents develop and are socialized in a mediated world. The media that adolescents use and the sexy media content that they consume is related to their sexual experience and development, and to youth intentions to engage in sexual activity (Pardun, L'Engle, & Brown, 2005). While this study offered some insight to the relationship between general media use and the initiation of various sex behaviors in opposite-sex attracted youth, there are limitations to how the findings can be interpreted and applied. First, this study examined the role of conventional media use on sexual initiation but does not measure or consider how much of media content used by adolescents actually contains sexy media representation, the manner in which youth engage the content, nor the context or setting in which youth are exposed to and consume media. One might assume that the more media consumed in general, the more likely one is to be exposed to sexy media, and that the total amount of media consumed is proportional to the amount of sexy media that individuals are exposed to.

As experimental research exploring adolescent sexy media exposure presents many ethical challenges, future research must then include the use of longitudinal data, more accurate and descriptive variables measuring media use and sexual behavior, and other innovative, rigorous analytical methods. Longitudinal methods can reveal relationships between factors that, while not necessarily causal, are influential in understanding and predicting the timing of debut of various sex behaviors – the timing of which has been linked to subsequent risk engagement later in adulthood. Longitudinal methods, coupled with more accurate measures of media use, sexy media exposure, media engagement and application, and perceptions of media realism can paint a better picture of the mechanisms through with media use can influence sexual socialization behavior in youth and young adults. Lastly, by adding the use analytical tools – such as Cox regression and stratified samples that explore intersectionality – one can move from the simple identification of significant associations among factors at a single point in time, to understanding how media use and other factors predict behaviors across time.

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# CHAPTER 5

## Adolescent Media Use, Race, Gender and Timing of Initiation of Sexual Behaviors in Same-Sex Attracted Youth

### Introduction

The newest reports from the U.S. Centers for Disease Control and Prevention reveal that significant health disparities exist between sexual minority (e.g., lesbian, gay, bisexual youth) and non-sexual minority youth (Kann, et al., 2016). More sexual minority youth engage in risky sex behaviors that place them at risk for sexually transmitted infection (STI), including human immunodeficiency virus (HIV), and other sexual health compromising consequences. A great deal of research has shown that lesbian, gay, bisexual (LGB), and/or queer youth are equally or more likely than their heterosexual peers to have ever had sexual intercourse and have relatively higher rates of early sexual debut (i.e., before 13 years of age) (Saewyc, 2011). In Saewyc's recent nationwide survey of youth, 50.8% of LGB students reported having ever had sexual intercourse, in comparison to 40.9% of heterosexual students. Among currently sexually active youth, a greater proportion of youth who had sexual contact with same-sex or both-sex partners engaged in STI/HIV risky behaviors, in comparison to their counterparts who reported sexual contact with only opposite sex; they were more likely to have initiated sex before the age of 13 years (14.9% vs 6.4%), have ≥4 lifetime sex partners (28.3% vs 20.9%), and have used alcohol and/or drugs at last sexual intercourse (31.0% vs 19.5%). In one study, lesbian, gay, and bisexual (LGB) youth were less likely than their heterosexual counterparts to engage in some STI/HIV risk-reducing behaviors, such as condom use at last sexual intercourse (47.5% vs 57.8%) (Kann, et al., 2016). But other research suggests that sexual minority youth engage in more of various health risky behaviors than heterosexual youth (Chyen, et al., 2011; Kann, et al., 2018), which

signals a need for a research that is unique to, and centers sexual minority youth, their behaviors and experiences.

During adolescence, parents, peers, schools, and media are salient sexual socializing agents for youth, in general, but the roles of these conventional influences become more complex in the case of sexual minority youth. As of 2016, only 24 states and the District of Columbia require public schools to teach sex education (Guttmacher Institute, 2016). While topics covered in school-based sex education programs vary - ranging from contraception, family planning, sexual orientation, and healthy sexual communication and decision-making and other topics - most states emphasize the importance of abstinence from sexual activity in health and sex education. Very few studies currently examine how informal socialization via parenting influences the sexual behavioral health and wellbeing of LGB youth (Bourdis, et al., 2010). Recent research highlights how formal sexuality education failed to meet the perceived needs of some sexual minority youth (Pingel, Thomas, Harmell, & Bauermeister, 2013), was "exclusive" rather than LGBT-inclusive (Gowen & Winges-Yanez, 2014), and was dominated by heteronormative discourses that marginalize issues affecting sexual minority youth (Schalet, et al., 2014), both nationally and internationally (Elia & Eliason, 2010). Studies exploring the relative roles of individuals in the social support networks of LGB youth show, while other sexual minority friends/peers provide the highest level of sexuality support, family and heterosexual friends are less available for sexuality-related stress support than for other stressors (Doty, Willoughby, Lindahl, & Malik, 2010).

Sexual minority (e.g., same-sex attracted) youth face stigma and discrimination in society that is linked to syndemic negative health behavioral consequences, including alcohol and substance use, having multiple sex partners, and having a history of sexually transmitted

infection (Coulter, Kinsky, Merrick, Stall, & Bauermeister, 2015). Peer victimization related to sexual orientation and gender expression is linked to compromised psychosocial wellbeing and health outcomes among youth, such as decreased sense of school belonging, increased levels of depressive symptoms, disruptions in educational trajectories, traumatic stress, and alcohol and substance use (Collier, Van Beusekom, Bos, & Sandfort, 2013). This may be exasperated for multiple minority youth, for whom the combined stress of both racial and antigay discrimination is linked to poor psychosocial outcomes (Thoma & Huebner, 2013).

As youth grow and develop, older adolescents begin to rely more on media as a source of information, shaping their beliefs about sex (Bleakley, Hennessy, Fishbein, & Jordan, 2009). The current study builds upon previous analyses (see Chapter 4 for analyses of opposite-sex attracted youth) examining adolescent media use and the initiation of sexual behavior across the life course in LGB youth. Informed by insights from the bioecological framework for adolescent media sexual socialization (BFAMSS) (Bethune, 2016) and by findings from the previous chapters, my study takes up adolescent media use and its influence on sexual behavior. My analysis centers adolescent media use in general, and takes into consideration the ways in which race, gender, and class may influence both media use and the development of sex behaviors across the life course. This study, while informed by the previous analysis of opposite-sex attracted youth, centers queer youth – and in particular, the experiences of same-sex attracted youth and young adults – acknowledging the variety of experiences and behaviors among youth, according to how they identify and exist within a heteronormative society. To explore these dynamics, I ask the following research questions:

1) *Does adolescent media use predict the timing of initiation of sexual behaviors (i.e., vaginal, anal, and oral sex) in same-sex attracted individuals across adolescence and early adulthood?*
2) *Does adolescent media use predict the timing of initiation of sexual behaviors in same-sex attracted individuals, when race, gender, and socioeconomic status are also considered?*

Using survival analysis, I examined these relationships among youth and young adults who self-report same-sex attraction. Research and practical implications of my findings are discussed.

## Literature Review

Same-sex attraction in youth is among the individual-level factors that some research has found to be protective against early sexual initiation during adolescence (Kirby, 2002). Reviews of literature suggest that same-sex attraction is a strong predictor of same-sex behaviors in adulthood, and while same-sex attraction emerges at diverse ages overall, there are distinct gender and cohort differences in the timing and nature of same-sex attraction reported during adolescence. As the same-sex sexual encounter might be timed as the earliest, intermediate, or final milestone in a trajectory including identity formation and development, self-labeling, disclosure, sexual behavior and activity, many same-sex attracted youth identify with a gay, lesbian, or bi-sexual orientation before (and some others, after) initiation of sexual activity (Savin-Williams & Cohen, 2007).

There are several research assumptions that can undermine and make it difficult to define, measure, and operationalize information about the sexual orientations of adolescents. For starters, the term “sexual orientation” is commonly used in research and in society to describe

what is actually an individual's sexuality. Further, its usage is predicated upon a foundation of both a gender and biological sex binary and the assumption that it is a fixed or immutable attribute, which often fails to map onto people's actual experiences (van Anders, 2015). van Anders's *sexual configurations theory* now helps us to understand people's sexualities and orientations along three dimensions: (1) identity – the labels, communities, politics, and social positioning of individuals; (2) orientation – the interests, approaches, attractions, and fantasies of individuals; and (3) status – the behaviors and activities of individuals. However, studies that have included multiple measures of sexual orientation – such as, identity, attraction, and behavior – show that these dimensions are not always concordant, one with each other, making it difficult to approximate distinct categories of sexual orientation with any single dimension or measure (Saewyc, 2011; Igartua, Thombs, Burgos, & Montoro, 2009). Additionally, while typical sexual identity labels (e.g., "gay", "lesbian", "bisexual") are relevant for most non-heterosexual youth (~70%), many other of non-heterosexual youth identify with alternative labels or may resist adopting and identifying with labels altogether (Russell, Clarke, & Clary, 2009). Further, conceptualizations of sexual orientation that enable possibilities for identities along continua representing more than one dimension of attraction pattern (e.g., extent of same-sex and opposite-sex attractions) are better supported than distinct labels along one dimension (e.g., hetero-, bi-, homosexual) (Vrangalova & Savin-Williams, 2012).

**Sexual Socialization, Behavior and Same-Sex Attracted Youth**

Media can influence young people's knowledge about, and acceptance of non-heteronormative sexual activity. Calzo and Ward (2009) found in their study of college students' media exposure and attitudes of acceptance toward homosexuality that variations in media

genres and consumer effects – such as gender, race, and ethnicity – influence the relationship between media use, attitudes toward homosexuality in the media, and global attitudes toward homosexuality. The authors suggested a mainstreaming effect might be at play, whereby groups of individuals with disparate attitudes toward homosexuality are drawn toward more similar attitudes as media exposure increases. Gender and race influenced the relationship between media exposure and the types attitudes toward homosexuality in a separate qualitative study. Calzo and Ward (2009) found that undergraduate students anecdotally reported receiving more frequent messages about homosexuality from media and peers than other socializing agents (e.g., parents). In that study, men and Black participants received fewer positive messages regarding homosexuality than did their gender and racial counterparts.

While the use and consumption of media that contain more diverse representations of sexual activity can lead to more acceptance of diverse sexual activity and interactions, content analyses of television programming indicate that sexual minority TV roles are underrepresented, in general. One study analyzing 22 TV situation comedies found that only 2% of roles were occupied by homosexual characters. The few roles that did exist in the TV programs, in turn, made significantly more comments and references to sexual orientation than did sexual non-minority roles. These findings suggest that television content creators emphasize and represent sexual orientation as a significant theme in the lives of homosexual individuals (Fouts & Inch, 2005). Still, sexy media messages and images, and in particular, those that contain sexually-explicit media content, may function to support the sexual socialization and development of sexual minority youth and young adults. For some sexual minority youth, media (e.g., internet, pornography) is a helpful socializer and sex educator at sexual initiation, especially in the absence of other sources of relevant sexual information (Kubicek, Beyer, Weiss, Iverson, &

Kipke, 2010). In a qualitative study exploring the role of sexually explicit material (SEM) for Black young men who sleep with men, SEM was primarily useful for sexual socialization and development purposes, such as sex organ functions, same-sex mechanics, negotiating sexual identity, and modeling sexual behavior (Arrington-Sanders, et al., 2015).

**The Bioecological Framework for Adolescent Media Sexual Socialization**

To fully understand the multidimensional, dynamic nature of adolescent sexual socialization and development, as well as the unique role that media plays in the context of other biopsychosocial factors and social influences, a robust ecological developmental framework is particularly useful. The bioecological framework for adolescent media sexual socialization (BFAMSS) draws insights from three theoretical perspectives on human development: (1) life course perspectives, (2) social ecological perspectives, and (3) media effects (Bethune, 2016). This framework not only considers the contexts (e.g., media) in which youth are proximally embedded, but also models how more distal contexts, systems, institutions, and dynamics (e.g., racism/sexism via race/ethnicity and gender) influence adolescent socialization and behavior.

Three propositions of the framework (see chapter 2), depicted in Figure 8, describe the relationships between media, sexual socialization and behavior, in the context of other social influences and systems. The first of the framework's three propositions inform the analysis presented in this chapter.

> By means of both conventional (e.g., radio, videos, television, magazines and other print media) and newer media forms (e.g., digital, social, and online), media are a salient and direct source of information, (re)presentations, imagery, and scripts that contributes significantly to the sexual socialization

and behavior of adolescents as they transition from childhood to early adulthood.

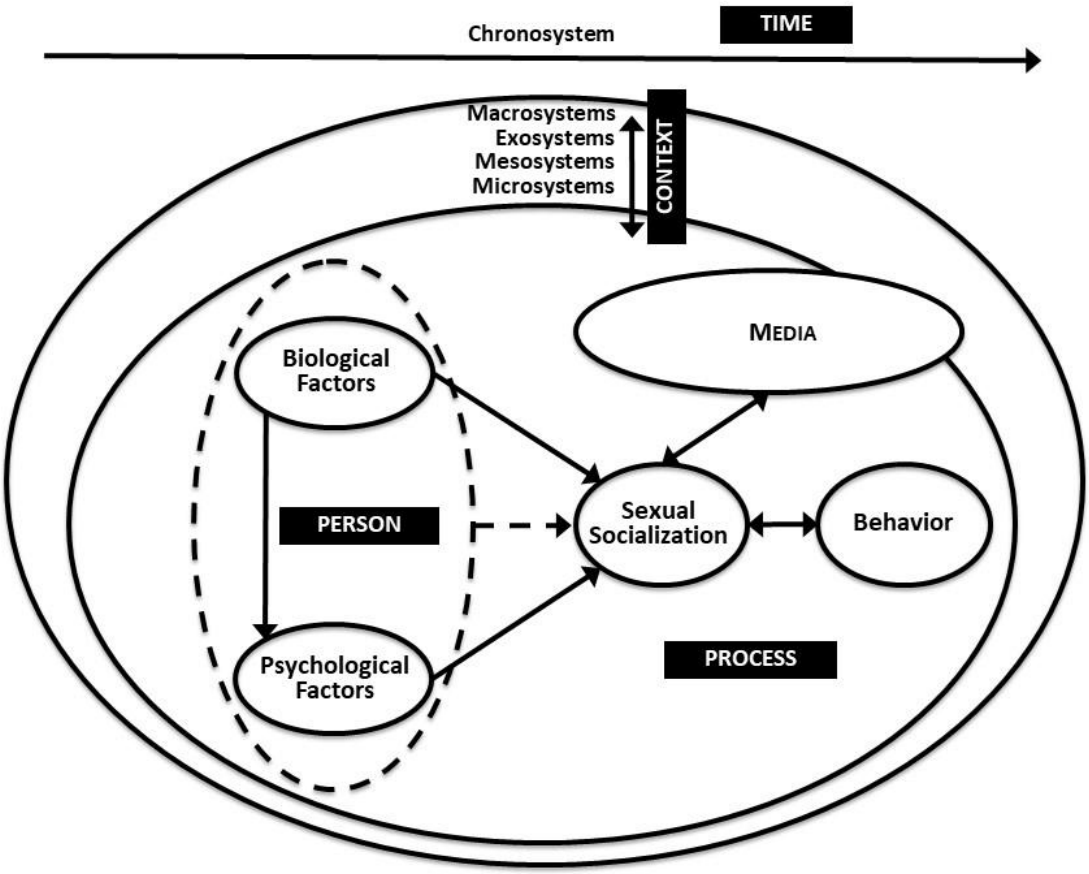


*Figure 8*. Bioecological Framework for Adolescent Media Sexual Socialization

In other words, media use during adolescence contributes to the sexual socialization of individuals in ways that ultimately shape and inform sex behaviors that emerge throughout adolescence and young adulthood. Mass media is an important context for adolescent sexual socialization, behavior and development, and is significantly correlated with youth intentions to have sex, and youth engagement in light to heavy sex behaviors (L'Engle, Brown, & Kenneavy,

2006). The mass media targeted at and consumed by adolescents abounds with suggestive and explicit sexual references (Callister, Stern, Coyne, Robinson, & Bennion, 2011; Hall, P. C., West, & Hill, 2012; Ybarra & Mitchell, 2005). On few occasions, responsible messages that actually promote safe sex, abstinence and sex-related health risks are included (Collins, Elliott, Berry, Kanouse, & Hunter, 2003; Ward, Day, & Epstein, 2006). Taken together, sex-related messages and images represented in media can affect how youth understand, process and apply information about sex, and can inform the development of certain sex behaviors.

As adolescents gain the psychological capacity to perceive and understand more of the world, and as the need for information grows, media emerges as a useful, accessible, and effective source of socialization. Media helps individuals to construct meaning, interpret their environments, and engage in interactions within their social worlds. Cultivation theory posits that exposure to media (e.g., television), over time, subtly cultivates viewers' perceptions of reality (Gerbner, Gross, Morgan, & Signorielli, 1986). Media messages and imagery (i.e., sexy media) targeting youth function as a primer, exposing them to the hegemonic values of dominant ideologies (e.g., White supremacy, patriarchy, capitalism, heteronormativity, Judeo-Christian beliefs, etc.) that shape and reinforce the hierarchical, stratified society in which we live. Insights from media dependency theory help us to recognize linkages between the audience viewing media, the media content itself, and how both are connected to larger social systems (Ball-Rokeach & DeFleur, 1976).

This study also acknowledges how the gendered, racialized, and heteronormative nature of sexual socialization, and the ways in which adolescent social ecologies also influence sexual development. Building on Chapter 3's findings regarding the role of media in adolescent sexual socialization and taking insights from Chapter 4's analysis of media's influence on adolescent

sexual initiation, the following analysis explores further the relationship between adolescent media use and the onset of sexual behaviors. In this case, I consider how media functions as a socializing agent for adolescents and explore how media use is related to the initiation of various sexual behaviors over the life course. Further, acknowledging how media can project and promote racialized, gendered, classified, and heteronormative representations and messages for sexual minority youth, I explore the ways in which race and gender influence sexual initiation, focusing on same-sex attracted youth. Lastly, this chapter, like Chapter 4, is informed by intersectionality theory (Bowleg, 2012; Bowleg, 2008; Collins & Bilge, 2016; Crenshaw, 1991), which frames the experiences of individuals as being shaped, not by one single dimension of social division, but rather at intersections of many axes of social division, taken together.

## Methods

This study used data from the National Longitudinal Study of Adolescent Health (Add Health)[13]. Add Health is the largest and most comprehensive survey of adolescents undertaken in the United States. The study began in 1994 with an in-school questionnaire, administered to a group of over 90,000 middle- and high-schoolers from a sample of 80 high schools and 52 middle schools from across the US. selected with unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured this sample was representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. Of those students, a portion were selected to participate in

[13] This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis.

an in-home interview the same time period (1994-1995). The initial wave consisted of the in-school and in-home questionnaires, vocabulary data, spatial data, school administrator responses and a parent questionnaire, and was followed up by three more data collection periods to date (Harris, et al., 2009). A 50% sample of Wave 1 in-home questionnaire data was available for public use, along with responses in Waves 2, 3, and 4.

**Procedures**

Publicly-available data from the in-home interview questionnaires administered during Waves 1, 2, 3, and 4 of the Add Health study were used in this analysis. The study population consisted of adolescents in grades 7 through 12 across the U.S. who completed an in-home questionnaire at Wave 1 from 1994 – 1995, and who were a part of the public-use subset of data. Wave 2 (N=4,834) was collected from April through August 1996, Wave 3 was collected from 2001 – 2002, and Wave 4 was collected in 2008 through follow-up interviews (Harris, et al., 2009). Institutional review board procedures were conducted for the larger study. The Institutional Review Board at Vanderbilt University was consulted for supplemental review of the current study; an application for review exemption was submitted and approved.

This analysis focused on the timing of initiation of various sex behaviors– vaginal-penetrative intercourse, oral sex, and anal sex. Research suggests that when more diverse sexual behaviors (e.g., coital and non-coital) are considered, then adolescents may exhibit varying sexual developmental trajectories within or outside of romantic relationships across racial, ethnic, gender, sexual orientation, and other subgroups of adolescents (Boislard, van de Bongardt, & Blais, 2016). As a rule of thumb, a minimum is 10 events (i.e. initiating sex) per predictor variable is suitable for a conservative approach to running Cox models (Vittinghoff &

McCulloch, 2007). Since analyses were conducted, stratified by race-by-gender subgroups, only racial groups with a sufficient sample size when split by gender (i.e., White, Black, Hispanic youth) were included in my analyses.

Sexual attraction is measured using Wave 3 and 4 self-reported data when participants were asked, on a scale of 1 to 6 (1= 100% heterosexual to 5= 100% homosexual, 6 = no sexual attraction to males or females), how they would describe their sexual attraction. Participants who reported at least some same-sex attraction (e.g., codes 2-5), who provided complete data for the key predictor, outcome and co-variate variables that are central to each respective analysis were included in this study (see Figure 9). Exclusion criteria included participants having missing data for any key variables central to each separate analysis, who did not report sexual attraction, or who reported opposite-sex attraction at Wave 3 or 4.

Experiencing sexual abuse – like other forms of child abuse – can have dire consequences in the form of psychological and behavior disturbances across development (Collin-Vezina, Daigneault, & Hebert, 2013). Of those participants who reported at least some same-sex attraction across Waves 1 through 4 (N=870), the 340 (39.1%) participants reported having experienced forced or coerced sex in any of Waves 1 through 4, and therefore were excluded from this analysis. Victims of childhood sexual abuse need more nuanced analysis performed for future research.

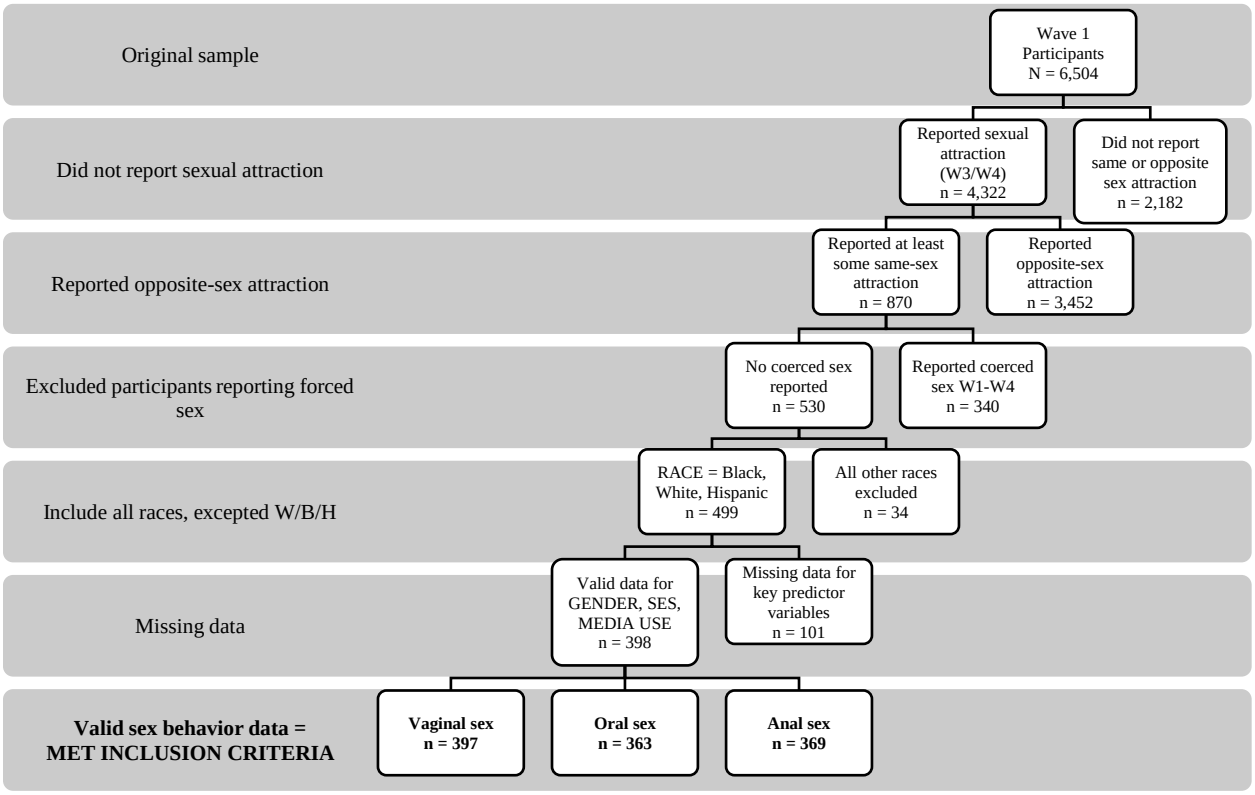


*Figure 9*. Inclusion/Exclusion Criteria for Same-Sex-Attracted Participants

## Demographic Characteristics

Demographic information included participants' race, gender, SES (e.g., household income, parental education), and age (in years) at Wave 1. Table 16 shows the demographic characteristics of participants who were included in analysis for each sexual behavior highlighted. Attrition analysis was performed using chi-square and analysis of variance in order to highlight key differences among same-sex attracted participants between those included in and

excluded from this analysis. For each sex behavior, White and male participants were slightly more likely to be included in analyses than their Black/Hispanic or female counterparts[14].

Table 16
*Demographic Characteristics of Same-Sex Attracted Participants from the Add Health Study*

| | Same-Sex Attracted Participants N = 870 | Vaginal Penetrative Sex Sample N = 397 | Oral Sex Sample N = 363 | Anal Sex Sample N = 369 |
|---|---|---|---|---|
| | % (n) | % (n) | % (n) | % (n) |
| Race/Ethnicity | | | | |
| White | 64.7 (563) | 71.8 (285) | 71.6 (260) | 71.3 (263) |
| Black/African American | 18.5 (161) | 17.4 (69) | 17.4 (63) | 17.9 (66) |
| American Indian/Native American | 1.5 (13) | -- | -- | -- |
| Asian or Pacific Islander | 3.3 (29) | -- | -- | -- |
| Hispanic/Latino | 11.1 (97) | 10.8 (43) | 11.0 (40) | 10.8 (40) |
| Other | 0.8 (7) | -- | -- | -- |
| Gender | | | | |
| Female | 78.2 (680) | 70.5 (280) | 70.8 (257) | 71.5 (264) |
| Male | 21.8 (190) | 29.5 (117) | 29.2 (106) | 28.5 (105) |
| Highest Parental Education | | | | |
| 8th grade or less | 2.3 (20) | 1.8 (7) | 1.6 (6) | 1.6 (6) |
| More than 8th grade; did not graduate HS | 5.5 (48) | 6.5 (27) | 6.9 (25) | 6.8 (25) |
| Business/trade/vocational school, instead of HS | 0.2 (2) | 0.3 (1) | 0.3 (1) | 0.3 (1) |
| HS graduate | 15.2 (132) | 17.9 (71) | 17.6 (64) | 17.6 (65) |
| Completed GED | 5.2 (45) | 3.8 (15) | 3.9 (14) | 4.1 (15) |
| Business/trade/vocational school after HS | 7.2 (63) | 7.8 (31) | 8.0 (29) | 7.6 (28) |
| Some college, did not graduate | 16.9 (147) | 20.4 (81) | 20.7 (75) | 20.9 (77) |
| Graduated, 4-year degree | 15.9 (138) | 17.6 (70) | 17.9 (65) | 18.2 (67) |
| Training beyond 4-year degree | 19.4 (169) | 23.9 (95) | 23.1 (84) | 23.0 (85) |
| Other/Missing | 12.2 (106) | -- | -- | -- |
| | Mean *(SD)* | Mean *(SD)* | Mean *(SD)* | Mean *(SD)* |
| Age (at Wave 1) | 15.8 (*1.7*) | 15.7 *(1.7)* | 15.7 *(1.7)* | 15.7 *(1.6)* |
| Household Income (thousands of dollars) | 56.1 *(84.1)* | 58.8 *(44.0)* | 57.9 *(91.0)* | 58.5 *(91.2)* |

[14] For the vaginal sex analysis, same-sex-attracted, included participants differed from those excluded by gender, $X^2$(1, N=870) 24.9, $p$<.01; and by race, $X^2$(5, N=870) 47.3, $p$<.01. For the oral sex analysis, included participants differed from those excluded by gender, $X^2$(1, N=870) 19.8, $p$<.01; and by race, $X^2$(5, N=870) 40.1, $p$<.01. For the anal sex analysis, included participants differed from those excluded by gender, $X^2$(1, N=870) 16.4, $p$<.01; and by race, $X^2$(5, N=870) 40.5, $p$<.01.

Independent samples t-tests were performed comparing the means of age in years at Wave 1 for participants, highest parental education, and annual household income between participants who were either included or excluded from each analysis. For the vaginal[15], oral[16], and anal sex analyses[17], included participants, on average, did not differ in income, age, and parental education from those excluded.

**Independent Variables**

In this analysis, media use was the main predictor variable, and race, gender, and socioeconomic status were covariates that were relevant to adolescent media use and sexual initiation, or that have been included in previous studies on this subject. Below is a description of how these factors were measured and operationalized for analysis. Table 16 contains more detailed information about each of the independent variables.

**Race.** *Race* (reported in Table 16) was computed using Wave 1 and 2 (discrepancies corrected) race and ethnicity data. Two dummy-coded variables (1= "Yes"; 0= "No") indicated

[15] For vaginal sex, the mean household income of same-sex attracted participants included (*M* = $58,700) was not significantly different from those excluded (*M* = $52,600). The mean age (in years) of included participants (*M* = 15.7) was not significantly different from those excluded (*M* = 15.8). The mean level of highest parental education among included participants (*M* = 7.5) was not significantly different from those excluded (*M* = 7.3).

[16] For oral sex, the mean household income of same-sex attracted participants included (*M* = $57,900) was not significantly different from those excluded (*M* = $54,200). The mean age (in years) of included participants (*M* = 15.7) was not significantly different from those excluded (*M* = 15.8). The mean level of highest parental education among included participants (*M* = 7.5) was not significantly different from those excluded (*M* = 7.3).

[17] For anal sex, the mean household income of same-sex attracted participants included (*M* = $58,500) was not significantly different from those excluded (*M* = $53,400). The mean age (in years) of included participants (*M* = 15.7) was not significantly different from those excluded (*M* = 15.8). The mean level of highest parental education among included participants (*M* = 7.5) was not significantly different from those excluded (*M* = 7.3).

whether participants reported that they were (1) White (i.e., "0" for both dummy variables), (2) Black or African American, or (3) Hispanic.

**Gender.** Gender (reported in Table 16) was binary, or "dummy"-coded using Wave 1 and 2 (discrepancies corrected) self-reported binary biological sex data. As the original variable was comprised of only two categories, a single dummy variable is sufficient to capture the information (Hardy, 1993), whereby *gender,* 1= "female"; 0= "male".

**Socioeconomic status.** Many studies have highlighted the difficulty and challenge of defining and measuring socioeconomic status for adolescent health research. While some research suggests that economic factors are most strongly correlated with subsequent health (Duncan, Daly, McDonough, & Williams, 2002), other research emphasizes that socioeconomic factors - such as education and income - are not interchangeable, and therefore, no single measure is the best representative proxy for SES (Braveman, et al., 2005). Often, current income, and education - which are commonly associated with various health outcomes – as well as other sociodemographic factors are used as variables or as parts of a composite measure that can yield a socioeconomic gradient (Shavers, 2007; Goodman, 1999; Bradley & Corwyn, 2002; Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010).

To measure *socioeconomic status* in this analysis using Add Health data, parent reports of education and household income were used from the in-home questionnaire. For each respondent, the highest level of education was reported for each of up to two parents. Similar to conventions used in previous Add Health studies, these data were re-coded to ordinal values, ranging from 1= "$8^{th}$ grade or less" to 8= "training beyond a 4-year degree" (see Table 16 for demographic breakdown). Then, the highest level of parental education between the two parents was computed, then standardized using the z-score, yielding *parental education*. For each

participant, the total household income, in thousands of dollars, was reported by a parent. To address the nonnormality (i.e., positive skewedness) of the reported household income data, the natural log of this value was computed, then standardized using the z-score, resulting in *household income* (see Table 16). *Parental education* and *household income*, were averaged, yielding a composite scale, *socioeconomic status.*

**Media use at Wave 1.** To measure overall media use at Wave 1, I computed the total weekly hours media was used, using the sum of 4 in-home questionnaire items from Wave 1, which represent the self-reported number of hours different types of media were used each week (i.e., television, videos, video/computer games, radio). To address the nonnormality (i.e., positive skewedness) of the reported media use data, the natural log of this sum was computed, resulting in a composite scale, *media use* (see Table 17).

## Outcome Variables

Survival analysis aims to analyze the timing of an event and addresses questions regarding whether and when the event of interest takes place (Guo, 2010). The dependent variable of survival analysis contains two pieces of information: (1) a continuous variable representing the timing of a participant's change process or event; and (2) a dichotomous change-of-state variable, often referred to as the event or censoring code. Survival analysis enables researchers to manage a common issue of incomplete data, called censoring. When exact event times are known for only a portion of study participants, Guo notes, survival analysis can accommodate right-hand censoring – situations in which the event of interest has not occurred by the end of data collection – and random censoring – a situation in which both an origin or entry

into observation, and ending point or termination of observation is known, but occurs for reasons other than the event of interest (e.g., participants drop from the study, etc.).

In each of the analyses, event of interest is the initiation of each of three sex behaviors: (1) vaginal penetrative intercourse, (2) receiving or giving oral sex, and (3) anal sex. The time-to-event variable measures either the age at which the sex behavior was initiated, or at which the participant was censored. The event code distinguishes those who initiated a sex behavior (code = "1") from others who were right-hand or randomly censored (code = "0"). The Cox proportional hazard model calculates the hazard of sexual initiation at each time point given for everyone still eligible to initiate sex because (1) they reported not having done so previously and (2) they remain in the sample. In my study, the timing of initiation of sex behavior is measured using the reported time from birth, or age at sexual initiation. Below is a description of how the three outcome variables were operationalized and measured for this study.

**Age at first vaginal sex.** To compute *age at first vaginal sex*, I used data from across all four waves. At Waves 1 and 2, participants reported the month and year of first sexual intercourse. Using this date and participant's month and year of birth, I computed the *age at first vaginal sex* in years. At Waves 3 and 4, participants reported their age at first sexual intercourse. If not reported in Waves 1 or 2, then this value was used. For participants who reported a non-event (i.e., not having initiated vaginal sex), the participant age at which the non-event was the last reported was the value used for this variable.

**Age at first oral sex.** To compute *age at first oral sex*, I used data from Waves 3 and 4. At Wave 3 participants reported the date that oral sex was first received for up to twenty relationships. Using the earliest of those dates and each participant's date of birth, I computed *age at first oral sex*. At Wave 4, participants reported the age in years of their first oral sexual

intercourse. The earliest age of first oral sex reported between Waves 3 and 4 was used for the final age at first oral sex variable. For participants who reported a non-event (i.e., not having initiated oral sex), the participant age at which the non-event was the last reported was the value used for this variable.

**Age at first anal sex.** To compute the *age at first anal sex*, I used data from Wave 4, when participants reported the age in years of their first anal sexual intercourse. For participants who reported a non-event (i.e., not having initiated anal sex), the participant age at which the non-event was the reported (Wave 4) was the value used for this variable.

## Analysis Plan

The Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corporation, 2017) was used to perform quantitative statistical analysis. Data were unweighted, as the use of statistical sample weights feature was not available using SPSS. Univariate (e.g., %, mean, standard deviation) and bivariate analyses were performed in order to describe and characterize key predictor variables. Then, I conducted hierarchical survival analysis regression analyses using the Cox proportional hazards model to examine the relationship between adolescent media use and the timing of initiation of vaginal, oral, and anal sexual intercourse. The Cox proportional hazard model is a semi-parametric, distribution-free model that does not require assumptions about the underlying distribution of survival times (Guo, 2010). Rather, the proportional hazards assumption is that "the hazard for any individual in a sample is a fixed proportion of the hazard for any other individual, and that the ratio of the two hazards is constant over time" (p. 75). With the partial likelihood estimation method deployed in a Cox model, the

likelihood function is solely expressed by the coefficients to be estimated (e.g., $\beta$) and the predictors.

While often debated and suggested that intersectional approaches might be best applied in qualitative research, a small but burgeoning body of scholarship offers support for the application and applicability of intersectional approaches in quantitative research (Bowleg, 2017; Gikiouleka, Huijts, Beckfield, & Bambra, 2018). Quantitative intersectionality approaches offer direction for measuring and practicing intersectionality, whereby social identities, the intersection of identities, and the implied social contexts shaping the experiences of people who embody them are theorized and quantitatively modeled (Bowleg, 2012; Bowleg, 2008). Rather than to simply consider the independent, additive effects of social and demographic factors, quantitative intersectional approaches include "an examination and comparison of additive, multiplicative, and intersectional effects" (Else-Quest & Hyde, 2016, p. 162). For this study, I conducted hierarchical survival analysis regressions using the Cox proportional hazard regression models to examine the additive (main), multiplicative (interactive), and intersectional (stratified) effects of adolescent media use, other covariates, and their interactions on sexual initiation.

To explore the main predictor variable of interest (Model 1), *media use* at Wave 1 was entered in the model predicting timing of sexual initiation. Model 2 examined the additive or simple main effects of *media use* and covariates – *race*, *gender*, and *SES*. To explore the potential moderating effects of gender on the relationship between media use and sexual initiation, Model 3 examined the multiplicative effects of a gender-by-media use (e.g., gender is the first-order moderator variable) two-way interaction. Here, I explored whether associations between media use and the timing of sexual initiation differed between female and male

participants. Model 4 included the additional multiplicative effects of race-by-media use (i.e., if the associations between media use and timing of sexual initiation differ by race) and race-by-gender (i.e., if the associations between gender and timing of sexual initiation differ by race) two-way interactions. Model 5 explored a potential three-way interaction between race, gender, and media use, whereby *media use* was the "focal independent variable", *gender* was the "first-order moderator variable", and *race* was the "second-order moderator variable" (Jaccard & Turrisi, 2003). Here, I explored whether the gender differences in associations between media use and initiation differed by race. Then, data were stratified by race-by-gender subgroups, and simple main effect models examining media use as a predictor of sexual initiation, controlling for SES.

To determine whether each estimated Cox model fit the data to an acceptable degree, model Wald chi-square tests were performed at the level of $p<.05$. For main effects models (Models 1, 2, and stratified models), relative risks or "hazard ratios" were used to examine the difference in timing of sexual initiation as a function of each independent variable, all others held constant; *p* values and 95% confidence intervals were also presented (Guo, 2010). To test the significance of statistical interactions and multiplicative effects (Models 3, 4, and 5), beta coefficients of interaction terms were examined, at the level of $p<.05$. The strength of interactions (Model 3 and 5) in standardized terms were determined by using the beta coefficients of the interaction terms and the change in $X^2$ (due to the addition of interaction terms of interest) (Jaccard & Turrisi, 2003). To make the interpretation of interactions easier, *media use* was grand mean-centered. Survivor functions, stratified by race-by-gender subgroup, were rendered (see Appendix D, E, and F for main effects, stratified by race-by-gender subgroups).

## Results

The study sample for each of the three sets of analyses were similar – N = 397 for vaginal sex, N = 363 for oral sex, and N = 369 for anal sex. Nearly all participants who were included in oral (91%) and anal sex (93%) analyses were also included in the vaginal sex sample.

### Media Use

Table 17
*Media Use by Race and Gender – Vaginal Intercourse Sample (N = 397)*

| | Media Use (hours per week) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>(n) | Male<br>Mean *(SD)*<br>(n) | Total<br>Mean *(SD)*<br>(n) |
| Race | | | |
| White | 40.7 *(31.9)*<br>(n = 200) | 36.1 *(28.1)*<br>(n = 85) | 39.3 *(30.8)*<br>(n = 285) |
| Black | 42.3 *(32.3)*<br>(n = 51) | 62.6 *(52.7)*<br>(n = 18) | 47.6 *(39.3)*<br>(n = 69) |
| Hispanic | 43.1 *(45.4)*<br>(n = 29) | 40.5 *(22.6)*<br>(n = 14) | 42.9 *(30.1)*<br>(n = 43) |
| Total | 41.3 *(33.5)*<br>(n = 280) | 40.7 *(33.5)*<br>(n = 117) | 42.3 *(39.2)*<br>(n = 397) |

On average, participants in these analyses used 42.3 ± 39.2 hours of media use per week. The average hours of weekly media use ranged from 40.5 (Hispanic males) to 62.6 hours (Black males) across race-by-gender subgroups. On average, participants did not differ in level of media

use across racial and gender groups[18]. For reference, Table 17 shows the average weekly hours of media use for participants included in the vaginal sex sample (the largest sample) by race, gender, and at their intersections.

**Vaginal Sex Initiation**

Table 18
*Age at Vaginal Sex Initiation by Race and Gender Among Youth Who Initiated the Behavior by Wave 4*

| | Age (in years) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>*%* (n) | Male<br>Mean *(SD)*<br>*%* (n) | Total<br>Mean *(SD)*<br>*%* (n) |
| Race | | | |
| White | 16.8 *(2.5)*<br>*93.0* (186) | 17.4 *(2.8)*<br>*81.2* (69) | 17.0 *(2.6)*<br>*89.5* (255) |
| Black | 15.7 *(2.0)*<br>*100.0* (51) | 15.2 *(2.8)*<br>*72.2* (13) | 15.6 *(2.2)*<br>*92.8* (64) |
| Hispanic | 17.5 *(2.5)*<br>*86.2* (25) | 16.5 *(2.4)*<br>*50.0* (7) | 16.6 *(2.3)*<br>*74.4* (32) |
| Total | 16.6 *(2.3)*<br>*93.6* (262) | 17.0 *(2.8)*<br>*76.1* (89) | 16.7 *(2.5)*<br>*88.4* (351) |

Of the 397 participants included in these analyses, 351 participants (~88%) reported having initiated vaginal sexual intercourse and had an average age of vaginal sex initiation of 16.7 ± 2.5 years old. Table 18 shows the number, percentage, and average age of vaginal sex

[18] In order to determine if, at Wave 1, *media use* differed for participants by race or gender, Kruskal-Wallis H tests were performed, comparing the means of the non-normally distributed data. Results showed that there was no statistically significant difference in weekly hours of media used between racial groups, $\chi^2(2) = 2.0$, $p = .37$, nor gender groups, $\chi^2(1) = 0.0$, $p = .84$.

initiation of participants (who had initiated vaginal sex by Wave 4) by race and gender. The average age of vaginal sex initiation ranged from 15.2 (Black males) to 17.5 years old (Hispanic females) across race-gender subgroups. Non-parametric statistical analyses indicated that, on average, female participants were significantly younger than males at vaginal sex initiation, and Black participants younger than both White and Hispanic.[19]

Table 19
*Hierarchical Models of Relative Risks of Vaginal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 1 - Univariate (unadjusted)* | | | |
| Media use | .16 | .07 | 5.24 | .02 | 1.17 | [1.02-1.34] |
| $\Delta X^2$ | 5.30* | | | | | |
| *df* | 1 | | | | | |
| | | | *Model 2 – Multivariate (adjusted)* | | | |
| Media use | .07 | .07 | .85 | .36 | 1.07 | [.93-1.23] |
| Black | .45 | .14 | 10.01 | .00 | 1.57 | [1.19-2.07] |
| Hispanic | -.50 | .20 | 6.37 | .01 | .61 | [.41-.90] |
| Female | .61 | .13 | 23.58 | .00 | 1.83 | [1.44-2.34] |
| SES | -.12 | .04 | 9.39 | .00 | .88 | [.82-.96] |
| $\Delta X^2$ | 48.96** | | | | | |
| *Df* | 5 | | | | | |

[19] In order to determine if the age at vaginal sex initiation differed for these participants by race or gender, Kruskal-Wallis H tests were performed to compare means of the non-normally distributed data. Results showed that there was a statistically significant difference in age at vaginal sex initiation between racial groups, $\chi^2(2) = 20.6$, $p<.001$, with a mean rank age at vaginal sex initiation of 188.5 for White, 124.3 for Black, 825.1, and 179.5 for Hispanic participants. A series of Mann-Whitney U tests indicated that age at vaginal sex initiation was statistically significantly younger for Black participants in comparison to White, $U = 5{,}169.0$, $p < .001$; and for Black participants in comparison to Hispanic, $U = 708.5$, $p < .05$. A Kruskal-Wallis H test also showed that females had a significantly younger age at vaginal sex initiation than male participants, $\chi^2(1) = 4.0$, $p < .05$.

Table 19
*Hierarchical Models of Relative Risks of Vaginal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| *Model 3 - Multivariate with gender x media use (GxM) interaction* | | | | | | |
| Media use | .21 | .14 | 2.44 | .12 | 1.24 | [.95-1.62] |
| Race (Black) | .44 | .14 | 9.31 | .00 | 1.55 | [1.17-2.05] |
| Race (Hispanic) | -.52 | .20 | 6.90 | .01 | .60 | [.40-.88] |
| Gender (Female) | .61 | .13 | 23.73 | .00 | 1.84 | [1.44-2.35] |
| SES | -.13 | .04 | 9.83 | .00 | .88 | [.81-.95] |
| G (female) x M | -.20 | .16 | 1.64 | .20 | .82 | [.60-1.11] |
| $\Delta X^2$ | 1.67 | | | | | |
| *df* | 6 | | | | | |
| *Model 4 - Multivariate with all two-way interactions GxM, RxM, RxG* | | | | | | |
| Media use | .36 | .15 | 5.89 | .02 | 1.43 | [1.07-1.91] |
| Race (Black) | .07 | .31 | .05 | .83 | 1.07 | [.58-1.97] |
| Race (Hispanic) | -1.06 | .41 | 6.72 | .01 | .35 | [.16-.77] |
| Gender (Female) | .44 | .14 | 9.40 | .00 | 1.55 | [1.17-2.04] |
| SES | -.12 | .04 | 9.30 | .00 | .88 | [.82-.96] |
| G (female) x M | -.28 | .16 | 2.99 | .08 | .75 | [.55-1.04] |
| R (Black) x M | -.33 | .20 | 2.85 | .09 | .72 | [.49-1.06] |
| R (Hispanic) x M | -.13 | .22 | .34 | .56 | .88 | [.57-1.36] |
| G (female) x R (Black) | .56 | .35 | 2.50 | .11 | 1.74 | [.88-3.46] |
| G (female) x R (Hispanic) | .73 | .46 | 2.50 | .11 | 2.07 | [.84-5.12] |
| $\Delta X^2$ | 8.44 | | | | | |
| *df* | 10 | | | | | |
| *Model 5 – Three-way interaction – R x G x M* | | | | | | |
| Media use | .34 | .16 | 4.39 | .04 | 1.40 | [1.02-1.93] |
| Race (Black) | -.01 | .35 | .00 | .97 | .99 | [.50-1.95] |
| Race (Hispanic) | -1.00 | .41 | 5.88 | .02 | .37 | [.17-.83] |
| Gender (Female) | .44 | .14 | 9.41 | .00 | 1.55 | [1.17-2.04] |
| SES | -.12 | .04 | 9.23 | .00 | .88 | [.82-.96] |
| G (female) x M | -.26 | .19 | 1.89 | .17 | .77 | [.53-1.12] |
| R (Black) x M | -.12 | .39 | 2.77 | .10 | 1.89 | [.89-4.02] |
| R (Hispanic) x M | -.45 | .61 | .54 | .46 | .64 | [.19-2.12] |
| G (female) x R (Black) | .64 | .38 | 2.77 | .10 | 1.89 | [.89-4.02] |
| G (female) x R (Hispanic) | .67 | .46 | 2.14 | .14 | 1.95 | [.80-4.80] |
| G (female) x R (Black) x M | -.29 | .45 | .41 | .52 | .75 | [.31-1.82] |
| G (female) x R (Hispanic) x M | .36 | .66 | .30 | .59 | 1.43 | [.39-5.21] |
| $\Delta X^2$ | .81 | | | | | |
| *df* | 12 | | | | | |
| $\Sigma X^2$ | 68.93** | | | | | |

*$p < .05$. **$p < .01$.

Table 19 displays the results of the hierarchical Cox proportional hazards models predicting the timing of vaginal sex initiation. In model 1, higher *media use* at Wave 1 was associated with earlier vaginal sex initiation. In model 2, which examined the additive simple main effects of race, gender, SES and media use, Black *race*, and female *gender* predicted earlier vaginal sex initiation, while Hispanic *race* and higher *SES* predicted later initiation. Model 3 examined the interactive effects of gender and media use – that is, the extent to which gender moderated the relationship between media use and vaginal sex initiation. Model 4 included additional two-way interactions, including the statistically significant interaction between race and gender, and model 5 added a three-way interaction of race, gender, and media use. None of the two-way nor the three-way interaction were statistically significant (e.g., yielded no significant change in $X^2$) in predicting vaginal sex initiation.

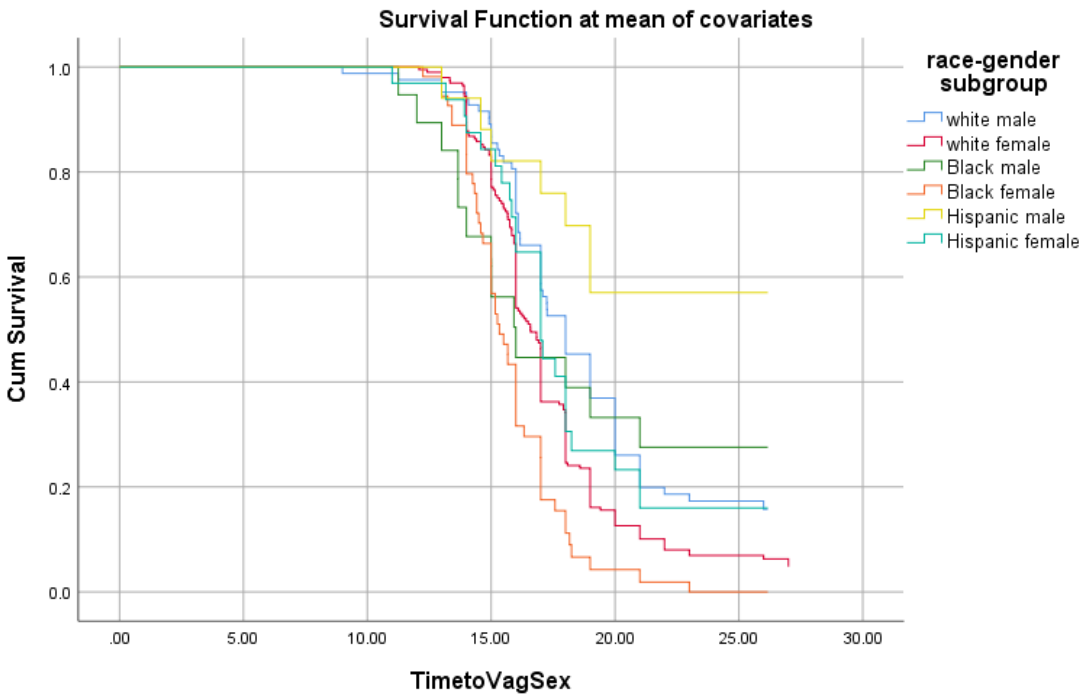


*Figure 10*. Cumulative Survival Function (Vaginal Sex), Stratified by Race-by-Gender Subgroups

Figure 10 depicts cumulative survivor curves, stratified into race-by-gender subgroup and plotted at the means of *media use* and *SES.* Appendix D shows models of main effects predicting timing of vaginal sex initiation as a function of *media use* and *SES* at intersections of race and gender subgroups. In stratified models, higher *media use* predicted earlier initiation for White males only. Lower *SES* predicted earlier initiation for White females only.

**Oral Sex Initiation**

Of the 397 participants included in these analyses, 350 participants (~88%) reported having initiated oral sex and had an average age of oral sex initiation of 16.7 ± 2.5 years old. Table 20 shows the number, percentage, and average age of oral sex initiation of participants (who had initiated oral sex by Wave 4) by race and gender.

Table 20
*Age at Oral Sex Initiation by Race and Gender Among Youth Who Initiated the Behavior by Wave 4*

| | Age (in years) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>*%* (n) | Male<br>Mean *(SD)*<br>*%* (n) | Total<br>Mean *(SD)*<br>*%* (n) |
| Race | | | |
| White | 16.9 *(2.7)*<br>*97.3* (177) | 17.1 *(3.2)*<br>*98.7* (77) | 17.0 *(2.8)*<br>*97.7* (254) |
| Black | 17.3 *(2.6)*<br>*95.8* (46) | 16.0 *(3.2)*<br>*80.0* (12) | 17.0 *(2.8)*<br>*92.1* (58) |
| Hispanic | 17.6 *(3.8)*<br>*92.6* (25) | 15.9 *(4.1)*<br>*100.0* (13) | 17.0 *(4.0)*<br>*95.0* (38) |
| Total | 16.6 *(2.3)*<br>*96.5* (248) | 16.8 *(3.4)*<br>*96.2* (102) | 16.7 *(2.5)*<br>*96.4* (350) |

The average age of oral sex initiation ranged from 15.9 (Hispanic males) to 17.6 years old (Hispanic females) across race-by-gender subgroups. Non-parametric statistical analyses indicated that, on average, participants were not significantly different in age at oral sex initiation by race or by gender[20].

Table 21 displays the results of the hierarchical Cox proportional hazards models predicting the timing of oral sex initiation. In model 1, higher *media use* at Wave 1 was not associated with earlier oral sex initiation. In model 2, no additive simple main effects of race, gender, SES and media use, predicting oral sex initiation were statistically significant. Models 3 examined the interactive effects of gender and media use – that is, the extent to which gender moderated the relationship between media use and oral sex initiation. Model 4 included additional two-way interactions – one examining race and gender, and the other race and media use. Model 5 added a three-way interaction of race, gender, and media use. None of the two- or three-way interactions were significant, and each yielded no significant change in the model $X^2$.

Table 21
*Hierarchical Models of Relative Risks of Oral Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 1 - Univariate (unadjusted)* | | | |
| Media use | -.04 | .07 | .32 | .58 | .96 | [.85-1.10] |
| $\Delta X^2$ | .31 | | | | | |
| *df* | 1 | | | | | |

[20] In order to determine if the age at oral sex initiation differed for these participants by race or gender, Kruskal-Wallis H tests were performed to compare means of the non-normally distributed data. Results showed that there was no statistically significant difference in age at oral sex initiation between racial groups, $\chi^2(2) = 1.7$, $p$=.43, nor by gender, $\chi^2(1) = 0.00$, $p$=.95.

Table 21
*Hierarchical Models of Relative Risks of Oral Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 2 – Multivariate (adjusted)* | | | |
| Media use | -.02 | .07 | .09 | .76 | .98 | [.86-1.12] |
| Black | -.17 | .15 | 1.35 | .25 | .84 | [.63-1.13] |
| Hispanic | -.18 | .18 | 1.03 | .31 | .83 | [.58-1.19] |
| Female | .05 | .12 | .17 | .68 | 1.05 | [.83-1.32] |
| SES | .04 | .04 | 1.15 | .28 | 1.04 | [.97-1.13] |
| $\Delta X^2$ | 4.45 | | | | | |
| *df* | 5 | | | | | |
| | | | *Model 3 - Multivariate with gender x media use (GxM) interaction* | | | |
| Media use | .00 | .12 | .00 | .99 | 1.00 | [.80-1.26] |
| Race (Black) | -.18 | .15 | 1.40 | .24 | .84 | [.63-1.12] |
| Race (Hispanic) | -.19 | .18 | 1.07 | .30 | .83 | [.58-1.13] |
| Gender (Female) | .05 | .12 | .16 | .69 | 1.05 | [.83-1.32] |
| SES | .04 | .04 | 1.08 | .30 | 1.04 | [.96-1.13] |
| G (female) x M | -.03 | .14 | .05 | .83 | .97 | [.73-1.28] |
| $\Delta X^2$ | .05 | | | | | |
| *df* | 6 | | | | | |
| | | | *Model 4 - Multivariate with all two-way interactions GxM, RxM, RxG* | | | |
| Media use | .01 | .13 | .00 | .97 | 1.01 | [.78-1.29] |
| Race (Black) | -.40 | .33 | 1.49 | .22 | .67 | [.35-1.28] |
| Race (Hispanic) | .29 | .31 | .87 | .35 | 1.33 | [.73-2.45] |
| Gender (Female) | .08 | .14 | .29 | .59 | 1.08 | [.82-1.42] |
| SES | .05 | .04 | 1.23 | .27 | 1.05 | [.97-1.13] |
| G (female) x M | -.04 | .15 | .08 | .77 | .96 | [.71-1.29] |
| R (Black) x M | .00 | .18 | .00 | .99 | 1.00 | [.70-1.43] |
| R (Hispanic) x M | .00 | .22 | .00 | .99 | 1.00 | [.66-1.53] |
| G (female) x R (Black) | .29 | .37 | .62 | .43 | 1.34 | [.65-2.74] |
| G (female) x R (Hispanic) | -.66 | .38 | 3.03 | .08 | .52 | [.25-1.09] |
| $\Delta X^2$ | 4.15 | | | | | |
| *df* | 10 | | | | | |

Table 21
*Hierarchical Models of Relative Risks of Oral Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 5 – Three-way interaction – R x G x M* | | | |
| Media use | .04 | .14 | .09 | .76 | 1.04 | [.79-1.38] |
| Race (Black) | -.38 | .34 | 1.30 | .25 | .68 | [.35-1.32] |
| Race (Hispanic) | .36 | .31 | 1.33 | .25 | 1.43 | [.78-2.62] |
| Gender (Female) | .07 | .14 | .26 | .61 | 1.07 | [.82-1.41] |
| SES | .05 | .04 | 1.27 | .26 | 1.05 | [.98-1.13] |
| G (female) x M | -.10 | .17 | .34 | .56 | .90 | [.64-1.27] |
| R (Black) x M | .09 | .32 | .07 | .79 | .92 | [.49-1.73] |
| R (Hispanic) x M | -.56 | .63 | .79 | .37 | .57 | [.17-1.95] |
| G (female) x R (Black) | .27 | .38 | .52 | .47 | 1.31 | [.63-2.74] |
| G (female) x R (Hispanic) | -.71 | .38 | 3.68 | .06 | .49 | [.23-1.02] |
| G (female) x R (Black) x M | .13 | .39 | .11 | .74 | 1.14 | [.53-2.44] |
| G (female) x R (Hispanic) x M | .64 | .67 | .91 | .34 | 1.89 | [.51-6.96] |
| $\Delta X^2$ | .95 | | | | | |
| *df* | 12 | | | | | |
| $\Sigma X^2$ | 9.72 | | | | | |

*$p < .05$. **$p < .01$.

Figure 11 depicts cumulative survivor curves, stratified into race-by-gender subgroup and plotted at the means of *media use* and *SES.* Appendix E shows models of main effects predicting timing of oral sex initiation as a function of *media use* and *SES* at intersections of race and gender subgroups. In stratified models, neither *media use* nor *SES* predicted initiation in any of the race-by-gender subgroups.

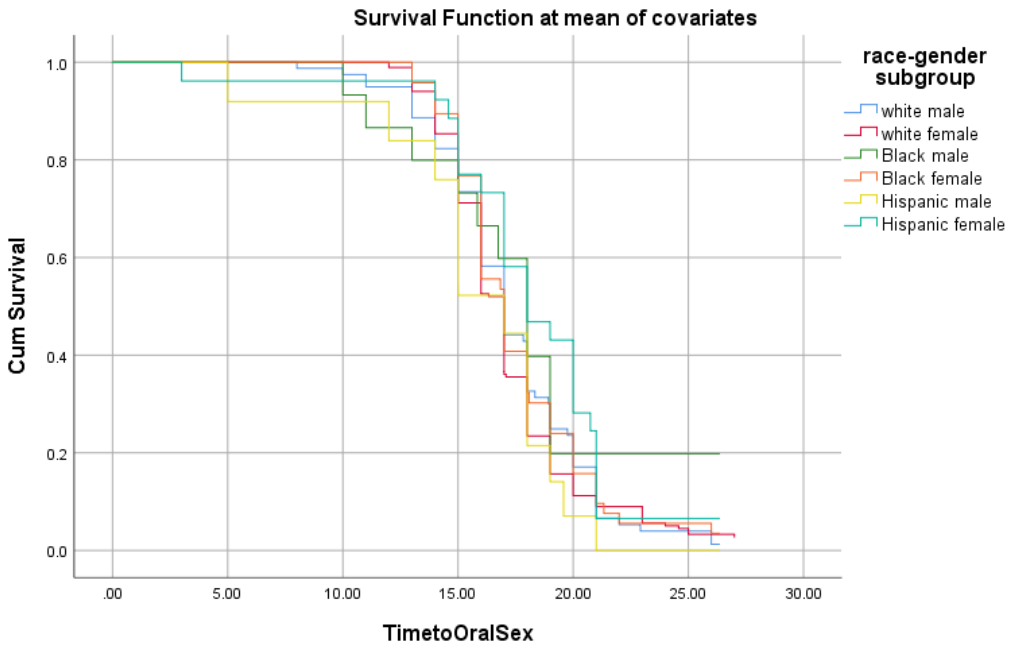


*Figure 11*. Cumulative Survival Function (Oral Sex), Stratified by Race-by-Gender Subgroups

**Anal Sex Initiation**

Of the 369 participants included in this analysis, 212 participants (~57%) – a much smaller proportion than initiates of both vaginal or oral sex - reported having initiated anal sex and had an average age of anal sex initiation of 20.6 ± 3.4 years old. Table 22 shows the number, percentage, and average age of anal sex initiation of participants (who had initiated anal sex by Wave 4) by race and gender. The average age of anal sex initiation between race-by-gender subgroups ranged from 19.3 (Black males) to 22.2 years old (Black females). Non-parametric statistical analyses indicated that, on average, there was no significant difference among participants in age at anal sex initiation by racial group or by gender[21].

[21] In order to determine if the age at anal sex initiation differed for these participants by race or gender, Kruskal-Wallis H tests were performed to compare means of the non-normally distributed data. Results showed that there was no statistically significant difference in age at anal sex initiation between racial groups, $\chi^2(2) = 1.1$, $p$=.58, nor by gender, $\chi^2(1) = 1.7$, $p$=.20.

Table 22
*Average Age at Anal Sex Initiation by Race and Gender Among Youth Who Initiated the Behavior by Wave 4*

| | Age (in years) | | |
|---|---|---|---|
| | Female<br>Mean *(SD)*<br>*%* (n) | Male<br>Mean *(SD)*<br>*%* (n) | Total<br>Mean *(SD)*<br>*%* (n) |
| Race | | | |
| White | 20.6 *(3.0)*<br>*54.3* (101) | 20.6 *(3.3)*<br>*62.3* (48) | 20.6 *(3.2)*<br>*56.7* (149) |
| Black | 22.2 *(4.8)*<br>*47.1* (24) | 19.3 *(4.1)*<br>*66.6* (10) | 21.3 *(4.7)*<br>*51.5* (34) |
| Hispanic | 20.8 *(2.7)*<br>*63.0* (17) | 19.4 *(2.6)*<br>*92.3* (12) | 20.2 *(2.7)*<br>*72.5* (29) |
| Total | 20.9 *(3.4)*<br>*53.8* (142) | 20.2 *(3.5)*<br>*66.6* (70) | 20.7 *(3.4)*<br>*57.5* (212) |

Table 23 displays the results of the hierarchical Cox proportional hazards models predicting the timing of anal sex initiation. In model 1, *media use* at Wave 1 did not predict initiation. In model 2, which examined the additive simple main effects of race, gender, SES and media use, Hispanic *race* and lower *SES* predicted earlier initiation, and female *gender* predicted later initiation. Model 3 examined the interactive effects of gender and media use – that is, the extent to which gender moderated the relationship between media use and anal sex initiation. Model 4 included additional two-way interactions, including the statistically significant interaction between race and gender, and model 5 added a three-way interaction of race, gender, and media use. None of the two-way or three-way interactions were statistically significant in predicting anal sex initiation.

Table 23
*Hierarchical Models of Relative Risks of Anal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 1 - Univariate (unadjusted)* | | | |
| Media use | -.07 | .09 | .75 | .39 | .93 | [.79-1.10] |
| $\Delta X^2$ | .75 | | | | | |
| *df* | 1 | | | | | |
| | | | *Model 2 – Multivariate (adjusted)* | | | |
| Media use | -.03 | .09 | .12 | .73 | .97 | [.82-1.15] |
| Black | -.06 | .19 | .09 | .77 | .95 | [.65-1.38] |
| Hispanic | .54 | .21 | 6.50 | .01 | 1.71 | [1.13-2.58] |
| Female | -.34 | .15 | 5.24 | .02 | .71 | [.54-.95] |
| SES | .09 | .05 | 3.03 | .08 | 1.09 | [.99-1.21] |
| $\Delta X^2$ | 13.09* | | | | | |
| *df* | 5 | | | | | |
| | | | *Model 3 - Multivariate with gender x media use (GxM) interaction* | | | |
| Media use | -.06 | .15 | .17 | .68 | .94 | [.70-1.26] |
| Race (Black) | -.05 | .19 | .07 | .80 | .95 | [.65-1.39] |
| Race (Hispanic) | .54 | .21 | 6.56 | .01 | 1.72 | [1.14-2.60] |
| Gender (Female) | -.34 | .15 | 5.18 | .02 | .72 | [[.54-.96] |
| SES | .09 | .05 | 3.05 | .08 | 1.09 | [.99-1.12] |
| G (female) x M | .05 | .18 | .07 | .80 | 1.05 | [.73-1.50] |
| $\Delta X^2$ | .07 | | | | | |
| *df* | 6 | | | | | |
| | | | *Model 4 - Multivariate with all two-way interactions GxM, RxM, RxG* | | | |
| Media use | -.09 | .17 | .27 | .60 | .92 | [.66-1.27] |
| Race (Black) | .38 | .37 | 1.04 | .31 | 1.46 | [.71-3.00] |
| Race (Hispanic) | 1.04 | .34 | 9.33 | .00 | 2.82 | [1.45-5.47] |
| Gender (Female) | -.17 | .18 | .92 | .34 | .84 | [.59-1.20] |
| SES | .09 | .05 | 2.99 | .08 | 1.09 | [.99-1.21] |
| G (female) x M | .13 | .19 | .42 | .52 | 1.13 | [.78-1.65] |
| R (Black) x M | -.25 | .23 | 1.15 | .28 | .78 | [.50-1.22] |
| R (Hispanic) x M | -.06 | .26 | .06 | .81 | .94 | [.57-1.56] |
| G (female) x R (Black) | -.55 | .44 | 1.60 | .21 | .58 | [.24-1.36] |
| G (female) x R (Hispanic) | -.74 | .43 | 2.99 | .08 | .48 | [.21-1.10] |
| $\Delta X^2$ | 4.68 | | | | | |
| *df* | 10 | | | | | |

Table 23
*Hierarchical Models of Relative Risks of Anal Sex Initiation*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio | 95% CI |
|---|---|---|---|---|---|---|
| | | | *Model 5 – Three-way interaction – R x G x M* | | | |
| Media use | .09 | .19 | .24 | .63 | 1.10 | [.76-1.58] |
| Race (Black) | .46 | .35 | 1.77 | .18 | 1.59 | [.80-3.15] |
| Race (Hispanic)_ | 1.09 | .33 | 10.57 | .00 | 2.96 | [1.54-5.69] |
| Gender (Female) | -.20 | .18 | 1.30 | .25 | .82 | [.58-1.16] |
| SES | .09 | .05 | 3.12 | .08 | 1.10 | [.99-1.22] |
| G (female) x M | -.15 | .23 | .41 | .52 | .87 | [.55-1.35] |
| R (Black) x M | -.94 | .42 | 5.07 | .02 | .39 | [.17-.89] |
| R (Hispanic) x M | -.76 | .60 | 1.60 | .21 | .47 | [.14-1.52] |
| G (female) x R (Black) | -.63 | .42 | 2.30 | .13 | .53 | [.23-1.20] |
| G (female) x R (Hispanic) | -.78 | .42 | 3.43 | .06 | .46 | [.20-1.05] |
| G (female) x R (Black) x M | 1.02 | .51 | 4.04 | .04 | 2.76 | [1.03-7.42] |
| G (female) x R (Hispanic) x M | .88 | .66 | 1.77 | .18 | 2.42 | [.66-8.90] |
| $\Delta X^2$ | 5.13 | | | | | |
| *df* | 12 | | | | | |
| $\Sigma X^2$ | 32.16** | | | | | |

*$p < .05$. **$p < .01$.

Figure 12 depicts cumulative survivor curves, stratified into race-by-gender subgroup and plotted at the means of *media use* and *SES.* Appendix F shows models of main effects predicting timing of anal sex initiation as a function of *media use* and *SES* at intersections of race and gender subgroups. In stratified models, higher *SES* predicted earlier initiation for Black females only.

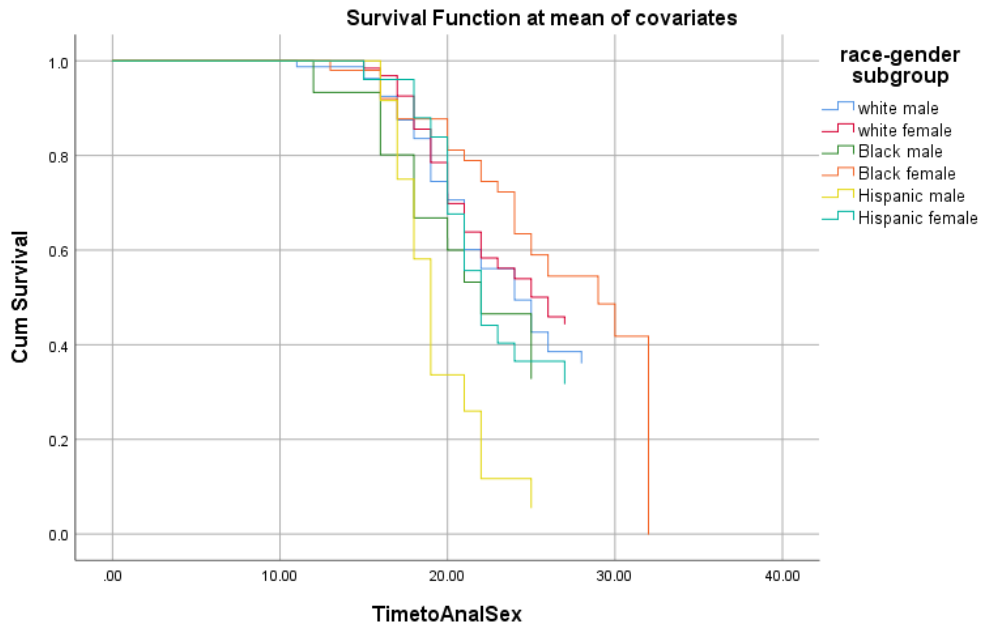


*Figure 12*. Cumulative Survival Function (Anal Sex), Stratified by Race-by-Gender Subgroups

**Race, Gender, and Socioeconomic Status**

In the multivariate models, race, gender, and SES were included as covariates. Independent associations between each of these factors and sexual initiation were rare and varied by sex behavior. While race was a significant factor for only vaginal sex initiation (see Table 19). *Black* race was associated with significantly earlier vaginal sex initiation and *Hispanic* race with later initiation.

Gender was independently associated with only vaginal sex initiation in adjusted models (see Table 19); *female* gender was associated with earlier initiation. SES was significant only in the adjusted models for vaginal sex initiation. Higher *SES* predicted later vaginal sex initiation.

### Interactions and Intersections

For each sex behavior, multivariate models, adjusted for race, gender, SES, and age, also included gender-by-media use, race-by-gender, race-by-media use, and race-by-gender-by-media use interaction terms (see Tables 19, 21, and 23). No significant interactions were detected in any of the models. To explore the relationship between media use and sexual initiation at intersections of race and gender, data were disaggregated and separate survival analyses were performed (see Appendix D, E, and F). Cox proportional hazards regression analyses were conducted for each of the following race-by-gender subgroups: 1) White males, 2) White females, 3) Black males, 4) Black females, 5) Hispanic males, and 6) Hispanic females. Higher *media use* was associated with a statistically significant earlier vaginal sex initiation for White males only. For White females, higher *SES* was associated with later vaginal sex initiation. For Black females, higher *SES* was associated with earlier anal sex initiation.

## Discussion

Findings from longitudinal analyses in this study showed that media use was significantly associated with vaginal, but not oral or anal sex initiation. Using higher amounts of media during adolescence was associated with earlier vaginal sex initiation. When race, gender, and socioeconomic status were also considered, media use was no longer independently associated with initiation of any of the sex behaviors. The findings from my study help to clarify the gendered and racialized patterns of media use and sexual initiation among SSA youth and shed light onto the relationship between media use, race, gender, socioeconomic status and the timing of sexual initiation.

Different from results from previous analyses featuring opposite-sex-attracted participants (see Chapter 4), adolescent media use among same-sex attracted youth was associated with age at initiation for only vaginal-penetrative sexual intercourse, and for neither oral nor anal sex. In models adjusted for race, gender, and socioeconomic status, adolescent media use was no longer a significant predictor of age at sexual initiation for any of the sex behaviors. Adjusted models also showed that Black race was associated with earlier vaginal sex initiation, but was not significant for other sex behaviors. Being Hispanic was associated with later vaginal sex initiation and with earlier anal sex initiation. Being Female was associated with an earlier vaginal and later anal sex initiation, and SES was associated with later vaginal sex initiation only. These independent associations of sexual initiation risk with race, gender, and SES illuminate the need for the inclusion of race, class, and gender as factors in analyses of sexual behaviors. Where one might expect consistent patterns to emerge along these dimensions, my study highlights the complexity of patterns, signaling the need for further examination into the mechanisms by which these social statuses are linked to the initiation of behaviors.

The extent to which adolescents perceive media representations, images, and messages to be realistic is linked to how media influences the sexual attitudes, beliefs, and in turn, behaviors of adolescents (Taylor, 2005). One study showed that for sexual minority youth who viewed a media portrayal featuring gay adolescents, there was increased emotional engagement with the media content and an increased sense of identification with the characters (Gillig & Murphy, 2016). My measure of media use conveys neither the amount of actual sexy media consumed nor the nature of the representations prevalent in the media content. While one might assume that the more media consumed in general, the more likely one is to be exposed to sexy media, and that the total amount of media consumed is proportional to the amount of sexy media that individuals

are exposed to. Still, the media use variable did not accurately reflect this, nor was the ways in which youth engage media content considered.

As data were disaggregated into race-by-gender subgroups, media use was a significant predictor, in unadjusted and adjusted models, of timing of sexual initiation for vaginal-penetrative sexual intercourse only, and only for White males. However, the measure of adolescent media use in this study represents total media use across various media types. Still, it is plausible that a significant association was found, as portrayals of White males in media – and heteronormative portrayals – are overrepresented. My study illuminates how analyses conducted at intersections (e.g., race-by-gender subgroups) are essential, as they provide additional insight to the independent and interactive influence of race, class, gender, and other contextual factors related to sex behaviors in young people.

Sexual orientation and its multiple dimensions are not constant; sexual orientation milestones can emerge and be articulated at different time points in development, and can evolve and change across different stages of the life course. In another study that utilized Add Health data, researchers explored the prevalence and stability of components of sexual orientation – including romantic attraction, sexual behavior, and sexual identity. Across three waves of data over the course of six years, they found that migration between same-sex to opposite-sex attraction and behavior worked in both directions over time, and varied by sexual orientation component (Savin-Williams & Ream, 2007). Overall though, the majority of sexual minority youth often remain consistently self-identified over time towards an increased integration of sexual identity (Rosario, Schrimshaw, Hunter, & Braun, 2006). The findings from this study account for this possibility, with participants included who expressed same-sex attraction, ranging from "…somewhat attracted to people of [their] own sex" to "100% homosexual," at

some point during the four waves of the study. Many participants across the range of sexual attractions reported having initiated coital (i.e., vaginal-penetrative) sex behavior at some point in their lifetime. Previous research shows that substantial incongruence between identity-related and behavioral dimensions of sexual orientation and that the level of incongruence varied across racial/ethnic and gender groups during adolescence (Mustanski, et al., 2014), continuing on through other stages of lifespan development (Chandra, Mosher, Copen, & Sionean, 2011).

Adolescents are exposed to a tremendous amount of media content each day. Previous studies estimate that youth between the ages 8 to 18 years old are exposed to over 11 hours of conventional media content, multitasking between TV content, music/audio, computer, video games, print, and movies (Rideout, Foehr, & Roberts, 2010). In my study, SSA adolescents were exposed to over forty hours of conventional media content (e.g., television, radio, computer/video games, videos/movies) each week. These estimates mirror the time that youth spend in a formal education context and the time many adults spend working a full-time job.

The approximations from the current study may underestimate actual media use and exposure among youth, as conventional media usage doesn't consider the time spent using Internet, digital, and social media. The number of teens that have or have access to smartphones has surged from a minority of 23% in 2011 and 37% in 2013 (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013) to almost universal access (95%) in 2017. In 2017, 45% of teens who use the Internet on a computer or cellphone say that they do so "almost constantly" (Anderson & Jiang, 2018). In order to get a more accurate understanding of adolescent media use, measures that include newer media forms, in addition to conventional media types, must be used. For example, studies show that Internet-using youth ages 13 to 18 years old frequently reported using the Internet to search for sexual health information. Gay/lesbian/queer youth are much more

likely (78%) than heterosexual youth (19%) to report doing so, and were more likely to cite privacy concerns and curiosity as reasons (Mitchell, Ybarra, Korchmaros, & Kosciw, 2014).

In particular, sexually-explicit media can provide information for youth, related to sexual development and behaviors of sexual minorities that may be rare or otherwise difficult to find and access (Arrington-Sanders, et al., 2015). Online media use should also be explored as a source of socialization, in order to better understand media's role in adolescent sexual socialization, behavior, and health - especially for sexual minority youth and youth who lack alternative sources of information. In a qualitative study involving a community sample of 32 LGBT youth from ages 16 to 24 years old, researchers found that participants perceived limitations in offline resources and relationships. Participants perceived the Internet not only to be a source of information, but also as an efficient way to discover and connect with LGBT peers, romantic partners, events, and services (DeHaan, Kuper, Magee, Bigelow, & Mustanski, 2013). Using the Internet to find sexual partners is not uncommon among sexual minority youth and young adults; those who do use Internet for this reason often go on to engage in high-risk sex behaviors that place them at risk for sexually transmitted infection (Garofalo, Herrick, Mustanski, & Donenberg, 2007).

Findings from in the *Generation M*$^2$ report (Rideout, Foehr, & Roberts, 2010) suggest that Black and Hispanic youth, in general, are exposed to substantially more media content than White youth. However, in my study SSA youth used similar levels of media content, across racial or gender subgroups. Still, as these findings suggest that the time spent overall using conventional media are consistent across racial and gender groups, measuring media use as time spent using conventional media and consuming any kind of content does not measure how much of the media consumed is comprised of sexy media content. One might assume that the more

media consumed in general, the more likely one is to be exposed to sexy media, and that the total amount of media consumed is proportional to the amount of sexy media that individuals are exposed to. It does not account for whether and how stereotypical images and messages influence the socialization processes, in ways that may impact how information is taken up and resonates among SSA youth. Existing exploratory research suggests that Black and White youth tend to similar levels of perceived realism (i.e. the extent to which viewers perceive media representation to be realistic) and media criticism (Ward, Day, & Thomas, 2010). Even if this is the case, measuring overall media use or a universal exposure, even in light of similar patterns of engagement, does not account for the frequency and nature of racialized, gendered, and heteronormative sexy media stereotypes, portrayals, advertisements, imagery, or information promoted in mainstream media.

Overall in this study, a substantial number of participants who reported on their sex behaviors have vaginal penetrative, oral, and/or anal sexual intercourse included in their sex behavior repertoires. Of SSA participants across all three sets of analyses, 42% reported an age of having initiated vaginal intercourse, 42% reported age at oral sex initiation, and 25% reported age at anal sex initiation. These findings are consistent with those from a nationally representative, cross-sectional study examining the prevalence of various sexual behaviors across age cohorts (Herbenick, et al., 2010), researchers found that the sexual repertoires of participants – including both coital and noncoital partnered and solo sexual behaviors within the previous month, year, and in the lifetime - varied across adolescent and adult-aged cohorts. In regard to adolescents, the study revealed that a variety of sexual behaviors are prevalent in the contemporary sexual repertoires in late adolescence and are common across the lifespan.

While this study points to a relationship between the amount of media used by adolescents and the timing of initiation of various sex behaviors across the life course, there are several limitations to the research design, methods and interpretability of findings. Analyses that aim to more comprehensively and robustly explore adolescent sexual initiation must have the requisite power in order to include as many as possible relevant variables, and the study procedures deployed in my analyses yielded a drastically reduced study sample. Still, there was a sufficient amount of data for the highlighted analysis. This study focuses on sexual minority youth through the inclusion of participants identified based on self-report data of only one component of sexual orientation identity (i.e., sexual attraction. Same-sex attracted youth were aggregated into one group, comprised of participants who expressed at least some same-sex attraction across the life course. In this case, the operationalization of sexual attraction in this manner permitted a more robust possible analysis. However, as other studies suggest (Matthews, Blosnich, Farmer, & Adams, 2014), doing so might have obscured important differences across the multiple sexual orientations therein. For example, it is possible and plausible that exclusively SSA and bisexual youth might have experienced different patterns of initiation of different sex behaviors.

For the purpose of exploring how media may be a source of socialization that shapes and influences the emergence of sex behaviors in the lives of youth and young people, this study is also limited by the measures used to explore a relationship between media and sexual behaviors. The measures and analyses fall short of substantiating whether the media content used is sexual in nature, the ways in which youth engage sexy media, and if in fact the longitudinal relationship between adolescent media use and sexual initiation is a function of socialization or media selection. Further, with limited data available on adolescent sexual behavior, this study engages

retrospective, self-reports of sexual initiation of only a narrow set of possible sexual behaviors among those possible and common among young people's sexual repertoires - including both coital and noncoital partnered and solo sexual behaviors (Herbenick, et al., 2010). As in chapter 4, this study relied on retrospective reports of sexual initiation, including time points that preceded Wave 1 data collection. For these participants, it was assumed that childhood levels of media use were largely consistent with adolescent levels and that the claims implied about the role of media use are still valid. Sample weights were not used in this analysis, and so the findings of this study are generalizable not to the general population, but rather are descriptive of the samples central in each of the analyses.

## Conclusions

Add Health (as noted in (Tolman & McClelland, 2011)) has produced several studies that offer insight into sexuality development of adolescents, some of which have challenged what is known about negative consequences of sex, and has provided insight informing contextual models of influence on adolescent sexuality. To date, there have been few studies that focus on sexual minority adolescents, and those that do are rarely longitudinal in design (Mustanski, 2015). This study deploys the use of longitudinal data using innovative methods to explore a relationship between adolescent media use and the risk of sexual initiation for sexual minority youth, diminishing the gap in research that focuses specifically on this under-researched population.

In order to comprehensively understand how sexual minority youth are socialized regarding sex behaviors, research is needed that considers the socializing influence of conventional and newer forms of media, in addition to family, peer, school, community contexts

of sexual minority youth that are proximal to their sexual development. Further, more longitudinal research that examines sexual socialization processes of adolescents, and the specific mechanisms by which media use and engagement is linked to sexual socialization, behavior, and development. The bioecological framework for adolescent media sexual socialization (Bethune, 2016) may serve as a helpful framework for modeling and testing these relationships.

Intersectionality theory also serves as a helpful framework for examinations that aim to understand more comprehensively the varieties of experiences of individuals. As an analytic tool and framework, intersectionality prescribes exploration at the intersections of identities and social statuses. This research explores the experiences of adolescents and their initiation of various sex behaviors, at intersections of sexual orientation, race, and gender, by including analyses performed on race-by-gender subgroups. Studies that use intersectionality as both a theoretical and analytic framework can offer more precise and descriptive insights into how we research and come to understand adolescent media use and its role in sexual socialization for diverse individuals across racial, gender, SES, and sexual orientation identities and statuses.

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# CHAPTER 6: Summary Insights and Future Research Directions

The overarching goal of this dissertation was to explore the extent of adolescent media use and its influence on various types of sexual socialization and sex behaviors. In the previous chapters, I have explored adolescent media use and its role in sexual socialization and behavior both conceptually – resulting in a working framework for adolescent media sexual socialization - and then empirically through three separate analyses using secondary data from the Add Health study.

Through these analyses, I have not only been able to answer the research questions laid out in each of the individual chapter, but have also gained additional insight across studies, and a greater understanding of the existing challenges and remaining gaps in research. In the following sections, I share the highlights of what I have learned about the relationship between media, sexual socialization and behavior. I will share about the challenges that I faced in my research, as well as those that I anticipate moving forward. Finally, I will share the major contributions made by my dissertation, and plans for future research, based on my learnings and expanding from my conceptual framework.

## Is Adolescent Media Linked to Sexual Socialization and Behavior?

In one of the propositions of the bioecological framework for adolescent media sexual socialization (BFAMSS), I state that conventional media is a source of information that "contribute[s] significantly to the sexual socialization and behavior of adolescents as they transition from childhood to early adulthood" (see Chapter 2). The analyses conducted in this dissertation do not refute this assertion. As a matter of fact, findings from the analyses suggest that adolescent media use is linked to sexual socialization later in adolescence (see Chapter 3)

and, for some, is associated with the timing of initiation of various sex behaviors throughout adolescence and early adulthood (see Chapters 4 and 5). My findings are not inconsistent with those of existing studies, whereby researchers have linked the greater use of mass media – and in particular, sexy media – to higher susceptibility and odds of sexual intercourse (L'Engle & Jackson, 2008); stronger endorsement of recreational attitudes toward sex, higher expectations of the sexual activity of one's peers, and more extensive sexual experience (Ward & Rivadeneyra, 1999); likelihood of sexual initiation (Collins, et al., 2004); and greater intentions to have sex and more sexual activity (L'Engle, Brown, & Kenneavy, 2006).

While my findings do not contradict the heavily researched link between adolescent media use, sexual socialization and behavior, both the literature and my analyses leave much to be explored, in regard to the framing of research that tests socialization hypotheses and that specify mechanisms by which media use influences socialization processes and behavior longitudinally. My analyses reveal several inconsistencies in the relationships between media, socialization, and behavior – whereby the significance of associations and directions of relationships vary by measure of sexual socialization or specific sex behavior of interest (see Table 24). There are several plausible reasons for these inconsistencies – both conceptual and methodological. Content analyses of popular music (Hall, West, & Hill, 2012), music videos (Wallis, 2011), television (Kunkel, et al., 2007), movies (Potts & Belden, 2009), video games (Stermer & Burkley, 2012), print (Reichert & Carpenter, 2004), Internet (Pardun, L'Engle, & Brown, 2005), and other media tell us that conventional media that is available to youth contains substantial amounts of sexualized content, and that popular media consumed by youth contain rare instances of sexually healthy content (Hust, Brown, & L'Engle, 2008).

Table 24
*Associations Between Predictor and Outcome Variables in Adjusted Models*

| | | | Race[a] | | | | |
|---|---|---|---|---|---|---|---|
| Dependent Variable | Media Use | SES | Black | AINA | API | Hispanic | Female |
| *Chapter 3* | | | | | | | |
| Sexual knowledge* | | + | | | | | |
| Sex risk perceptions* | | | + | | | | - |
| Beliefs about pregnancy* | | - | + | | | | |
| Perceived birth control efficacy* | + | - | | | | | |
| Myths about birth control* | | + | | - | - | | + |
| *Chapter 4 (Opposite-Sex-Attracted Participants)* | | | | | | | |
| Vaginal sex initiation | ↑ | ↓ | ↑ | | | | ↓ |
| Oral sex initiation | ↑ | | ↓ | | | ↓ | ↓ |
| Anal sex initiation | | | ↓ | | | | ↓ |
| *Chapter 5 (Same-Sex-Attracted Participants)* | | | | | | | |
| Vaginal sex initiation | | ↓ | ↑ | | | ↓ | ↑ |
| Oral sex initiation | | | | | | ↑ | |
| Anal sex initiation | | | | | | ↑ | ↓ |

* Adjusted models controlled for sexual socialization at Wave 1
+/- Positive or negative association significant at a $p<.05$
↑/↓ Earlier/later initiation
[a] Racial categories Black, AINA (American Indian/Native American), API (Asian/Pacific Islander), Hispanic

It is conceptually reasonable, then, for conventional media use to be more strongly associated with some components of sexual socialization – particularly those areas of sexual socialization that are rendered and represented more frequently in media – and less associated with others.

Methods-wise, while the association between adolescent media use and sexual socialization and behaviors is interesting, the way that media use is measured and operationalized in my analyses to capture only the amount of media used, and include only four types of conventional media, limits how we can interpret findings. The universal measure of weekly media used does not reflect how much of the media consumed was actually sexy media content. Further, the analyses do not consider the nature of sexy media content – whether explicit or innuendo, whether power dynamics are represented, or other qualitative characteristics. Lastly, the context of media use is not known. For example, we do not know whether media use and its association with socialization and behavior is due to media's influence on the outcomes of interest – which supports a socialization-oriented hypothesis – or whether youth who are socialized in a certain manner or who exhibit certain sex behaviors are more prone to use media – which supports media selection hypotheses. While the bioecological framework for adolescent media sexual socialization (BFAMSS) postulates the possibility of both, the research framed in this dissertation explores only the socialization hypotheses, when either or both may in fact be true and supported by the data.

## Race, Class, Gender, and Sexual Orientation Matter

In this dissertation's analyses, each chapter illuminated various ways in which race, class, gender, and sexual orientation mattered in examinations of media use, sexual socialization, and sexual behavior. In many cases, I found that adolescent media use differed significantly by race

and gender. In some other analyses, the average age of sexual initiation differed significantly by race and gender among both opposite- and same-sex-attracted participants for some of the sex behaviors. At times, race, class, and gender had unique and independent explanatory value in models. In other instances, these factors, in some way, modified the relationship between adolescent media use and socialization or behavior outcomes of interest. In regard to sexual orientation, adolescent media use was a significant predictor of the timing of sex behaviors of some opposite-sex-attracted participants (see Chapter 4) in ways that did not materialize for the same-sex-attracted participants (see Chapter 5) (see Appendix G for summary tables listing the significant predictors of risk of vaginal, oral, and anal sex initiation for opposite-sex and same-sex-attracted participants).

Perhaps some of the most interesting findings in this dissertation were discovered through intersectional analyses of race/gender/sexual orientation subgroups. In Chapters 4 and 5, there were few associations between adolescent media use and the age of sexual initiation across sex behaviors. In adjusted models that also considered race, gender, and SES in opposite-sex-attracted participants, adolescent media use was a significantly associated with risk of initiation of vaginal and oral, but not anal sexual intercourse in opposite-sex-attracted participants. For same-sex-attracted participants, adolescent media use was not significantly associated with risk of sexual initiation in the adjusted models for any of the sex behaviors. However, in intersectional analyses of race/gender subgroups, adolescent media use was associated with risk of vaginal sex initiation only among opposite-sex-attracted white males and white females and same-sex-attracted white males; adolescent media use was associated with risk of oral sex initiation among opposite-sex-attracted white males, only.

My findings highlight how one can gain additional insight by conducting intersectional quantitative analyses, whenever possible. Here, I was able to explore nuances in how media is thought to influence, or otherwise be related to sexual behavior. Quantitative intersectionality is a useful approach to media and sexual health research, but it is important to note limitations of my work to effectively represent an intersectionality orientation and approach. First, quantitative intersectional approaches largely reproduced methodologies that model identities, statuses, conditions and experiences as being additive – or at best, interactive in nature. In reality, the experiences of individuals are infinitely intersectional. As Professor Kimberlé Crenshaw – who coined the term *intersectionality* – noted of her treatment and analysis of the lives of women of color, "intersections of race and gender only highlights the need to account for multiple grounds of identity when considering how the social world is constructed" (Crenshaw, 1991, p. 1244). Intersectionality implores us all to consider, not only identity theory, but also structural and political aspects of our socially constructed worlds. Reflecting on the intersection modeled and postulated in my work, I find opportunity to entertain new ideas and to pursue different narratives about race, class, gender, sexual orientation, and media and their role in shaping human behavior.

## Challenges in Media and Sexuality Research in Adolescence

Adolescence presents what researchers call a "double-edged sword" (Lerner & Galambos, 1998), whereby in one regard, it represents a period of life when a slew of risk behaviors may appear and persist; at the same time, adolescence is a transition during which youth are impressionable, and exist in dynamic conditions that shape how youth encounter and navigate challenges, and overcome risks along the way. Similar to challenges in adolescence,

there are a related set of ethical and practical challenges and issues faced when conducting research on adolescence and involving adolescents. Scientists and experts focused on youth, technology, and health have identified and made recommendations regarding community-research partnerships; theoretical frameworks; privacy, confidentiality, and institutional research board review; intervention development; implementation and evaluation; and several other areas and phases of research that present unique challenges in youth research (Allison, et al., 2012).

Media research also presents unique challenges. Advances in media technologies – especially the emergence and widespread adoption and utilization of the Internet – have made it necessary to revisit, review, and update research on media use and its effects on adolescents. While the conventional media, such as television, radio, print media and later, video games largely comprised the media forms used in the 20th century, 21st century advances in media technology has brought about newer forms of media – the Internet, digital, and social media included – and along with it, new ways of engaging media content. By the turn of the century, research on adolescents had identified links between media use and exposure and risky behavior; however the effects and impact of media - including newer media forms - on adolescent socialization and behavior have not been adequately studied (Villani, 2001). As media can offer benefits for adolescent development and health (e.g., education, socialization, connection) and also present risk in the form of socialization and influence on health compromising behaviors (e.g., health misinformation, risky messages and images, Internet addiction), it is apparent that additional research is needed to explore the roles of old and new media in the socialization and development of adolescents (Strasburger, et al., 2013), and this research should use diverse approaches in order to offer the most up-to-date information and insight on media use and effects in a digital age (Borzekowski, 2006). One must also consider the various methodological,

ethical, and legal considerations of conducting media research, especially studies exploring digital and social media (Moreno, Goniu, Moreno, & Diekema, 2013). Studies are needed that identify the harmful effects of old and new media on adolescent sexual behavior, and that inform ways that these effects and related risks can be mitigated, including the ways that new media can be leveraged to improve adolescent sexual health (Guse, et al., 2012; Pinkleton, Austin, Cohen, Chen, & Fitzgerald, 2008).

## Contributions and Implications of the Current Research

While there are many challenges encountered when conducting research on adolescence, media, socialization, and sexual behavior, there were many insights garnered and research contributions of this dissertation research. This dissertation aimed to deepen the understanding of the relationship between media use and adolescent development. Specifically, this work offers preliminary insight into some of the linkages between media, adolescent socialization and behavior that are conceptualized in the bioecological framework for adolescent media sexual socialization. The analyses and findings confirmed much of what is already known about the relationships among media, socialization, and behavior; that is, in some cases, adolescent media is linked to sexual socialization and development. My findings also hint at media's influence on some areas of adolescent sexual socialization across time, even when factors such as race, gender, and socioeconomic status are also considered. The use of longitudinal data in these studies help us to understand how adolescent media use might be linked to socialization processes across the adolescent transition and how media may influence the onset of sexual behavior later in adolescence and in early adulthood. While assessments of causality were not

possible given the research design of this dissertation, the findings still yield longitudinal associations that can be further explored in future research.

In terms of adolescent sexual behavior, my findings revealed that the significance of media use in predicting the risk of sexual initiation depended, in some cases, was moderated by demographic factors, such as race, gender, and sexual orientation, and varied by type of sex behavior. In some instances, the socioeconomic status of participants was also linked to risk of sexual initiation, especially among opposite-sex attracted youth. In models where media use was significantly associated with risk of onset of sex behavior, higher media use was associated with increased risk of sexual initiation. It is plausible, while only partially explored (e.g., level of overall media use) and substantiated in this dissertation, that higher levels of media use are indicators of higher levels of sexy media exposure, which may in turn, increase sexual socialization processes that place youth at risk for sex risk engagement (e.g., hastened sexual initiation).

My findings also highlight the utility and need to examine these relationships at intersections of racial, gender, and sexual orientation identities. Many of my analyses illuminated both independent and interactive influences of race, class, gender, and other contextual factors related to sex behaviors in young people. Media, sexual socialization, and behavior are linked, and these linkages are observed and significant to a greater degree among dominant groups (e.g., White, heterosexual adolescents). While universal measures of media use only offer a glimpse into how media may be related to socialization and behavior, this dissertation can serve as a springboard for more nuanced analyses that take into consideration the complexity of media use and engagement, adolescent socialization processes, and other mitigating and contextual factors and mechanisms that are salient for adolescent sexual development.

## Future Research Directions

New measures are being taken in the research community to collect data that addresses the need to understand the evolving media landscape in which youth are immersed. For example, The National Survey of Children's Health (Data Resource Center for Child and Adolescent Health, 2018) panel study collects data annually on 300 indicators of the health and wellbeing of children and their families, including measures of media usage (i.e., time spent watching TV, time spent using a computer/electronic device). The Youth Risk Behavioral Survey (YRBS) (U.S. Centers for Disease Control and Prevention, 2018) is a part of a nationally-representative panel study that includes questions on media usage (i.e., TV viewing hours, time spent using computers or playing video games), and sexual behavior (i.e., sexual activity, age at first sexual intercourse). The Pew Research Center (Pew Research Center, 2018) conducts panel studies that produces annual data that "[inform] the public about the issues, attitudes and trends shaping the world." Although offering only cross-sectional snapshots of current trends, future research can draw upon these datasets or ones similar in order to better characterize and describe the media diets of today's adolescents and how today's adolescents' media usage is related to their health and wellbeing.

Like this dissertation research, future studies should also draw from longitudinal data in order to model and examine the enduring effects of media use on adolescent socialization and behavior. To extend the work of this dissertation, the full dataset of the Add Health study, complete with sample weights can be used in order to amplify power for analysis and to yield findings that may be generalizable to the U.S. population. With full Add Health data can also be used to examine other relationships proposed in the BFAMSS framework, such as the enduring role of media use when contextual factors, such as peer and family influences, are also

considered, and drawing from intersectionality theory, can explore these relationships at intersections of critical identities or conditions in adolescence. Finally, future research should endeavor to qualitatively, as well as quantitatively, explore how media use influences adolescent sexual development. For example, more in-depth surveys, interviews, and focus groups with youth and young adults can provide rich insight to the nature of media exposure and media practice processes that adolescents engage, and the mechanisms by which media use contributes to sexual socialization and influences sexual behavior across the life course.

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# APPENDICES

## Appendix A

*Adjusted Relative Risks of Vaginal Sex Initiation of Opposite-Sex-Attracted Participants, Stratified by Race-by-Gender Subgroup*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio |
|---|---|---|---|---|---|
| | | White Males (*n*=822) | | | |
| Media use (Wave 1) | .13 | .05 | 6.91 | .01 | 1.14 |
| SES | -.17 | .03 | 36.62 | .00 | .84 |
| $X^2$ | 49.32** | | | | |
| *df* | 2 | | | | |
| | | White Females (*n*=611) | | | |
| Media use (Wave 1) | .17 | .06 | 8.86 | .00 | 1.19 |
| SES | -.16 | .03 | 27.90 | .00 | .85 |
| $X^2$ | 42.19** | | | | |
| *Df* | 2 | | | | |
| | | Black Males (*n*=223) | | | |
| Media use (Wave 1) | .10 | .09 | 1.14 | .29 | 1.11 |
| SES | -.13 | .05 | 7.44 | .01 | .88 |
| $X^2$ | 8.37* | | | | |
| *Df* | 2 | | | | |
| | | Black Females (*n*=239) | | | |
| Media use (Wave 1) | -.05 | .09 | .32 | .57 | .95 |
| SES | -.22 | .04 | 24.39 | .00 | .81 |
| $X^2$ | 24.78** | | | | |
| *Df* | 2 | | | | |
| | | Hispanic Males (*n*=109) | | | |
| Media use (Wave 1) | .04 | .15 | .09 | .77 | 1.05 |
| SES | -.11 | .06 | 3.22 | .07 | .90 |
| $X^2$ | 4.01 | | | | |
| *Df* | 2 | | | | |
| | | Hispanic Females (*n*=82) | | | |
| Media use (Wave 1) | .25 | .15 | 2.60 | .11 | 1.28 |
| SES | .02 | .07 | .10 | .75 | 1.02 |
| $X^2$ | 3.05 | | | | |
| *df* | 2 | | | | |

*$p < .05$. **$p < .01$.

Appendix B

*Adjusted Relative Risks of Oral Sex Initiation of Opposite-Sex-Attracted Participants, Stratified by Race-by-Gender Subgroup*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio |
|---|---|---|---|---|---|
| | | White Males (*n*=813) | | | |
| Media use (Wave 1) | .10 | .05 | 3.95 | .05 | 1.11 |
| SES | -.04 | .05 | 3.95 | .17 | .96 |
| $X^2$ | 6.85* | | | | |
| *df* | 2 | | | | |
| | | White Females (*n*=598) | | | |
| Media use (Wave 1) | .09 | .06 | 2.43 | .12 | 1.09 |
| SES | .01 | .03 | .02 | .88 | 1.01 |
| $X^2$ | 2.44 | | | | |
| *Df* | 2 | | | | |
| | | Black Males (*n*=212) | | | |
| Media use (Wave 1) | .05 | .09 | .28 | .60 | 1.05 |
| SES | .05 | .05 | 1.07 | .30 | 1.05 |
| $X^2$ | 1.44 | | | | |
| *Df* | 2 | | | | |
| | | Black Females (*n*=227) | | | |
| Media use (Wave 1) | -.02 | .09 | .05 | .83 | .98 |
| SES | .12 | .05 | 5.95 | .02 | 1.13 |
| $X^2$ | 6.14* | | | | |
| *Df* | 2 | | | | |
| | | Hispanic Males (*n*=107) | | | |
| Media use (Wave 1) | .13 | .15 | .80 | .37 | 1.14 |
| SES | -.00 | .06 | .00 | .97 | 1.00 |
| $X^2$ | .90 | | | | |
| *Df* | 2 | | | | |
| | | Hispanic Females (*n*=80) | | | |
| Media use (Wave 1) | -.14 | .16 | .76 | .39 | .87 |
| SES | .13 | .07 | 3.02 | .08 | 1.14 |
| $X^2$ | 3.49 | | | | |
| *df* | 2 | | | | |

*$p < .05$. **$p < .01$.

Appendix C

*Adjusted Relative Risks of Anal Sex Initiation of Opposite-Sex-Attracted Participants, Stratified by Race-by-Gender Subgroup*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio |
|---|---|---|---|---|---|
| | | White Males (*n*=819) | | | |
| Media use (Wave 1) | .04 | .08 | .28 | .60 | 1.04 |
| SES | -.07 | .04 | 2.57 | .11 | .94 |
| $X^2$ | 3.17 | | | | |
| *df* | 2 | | | | |
| | | White Females (*n*=603) | | | |
| Media use (Wave 1) | -.15 | .10 | 2.35 | .13 | .86 |
| SES | -.03 | .05 | .40 | .53 | .97 |
| $X^2$ | 2.53 | | | | |
| *Df* | 2 | | | | |
| | | Black Males (*n*=219) | | | |
| Media use (Wave 1) | .03 | .15 | .03 | .86 | 1.03 |
| SES | .00 | .08 | .00 | .99 | 1.00 |
| $X^2$ | .03 | | | | |
| *Df* | 2 | | | | |
| | | Black Females (*n*=235) | | | |
| Media use (Wave 1) | -.05 | .18 | .09 | .76 | .95 |
| SES | .19 | .10 | 3.78 | .05 | 1.21 |
| $X^2$ | 3.99 | | | | |
| *Df* | 2 | | | | |
| | | Hispanic Males (*n*=107) | | | |
| Media use (Wave 1) | .00 | .20 | .00 | .99 | 1.00 |
| SES | -.10 | .09 | 1.14 | .29 | .91 |
| $X^2$ | 1.28 | | | | |
| *Df* | 2 | | | | |
| | | Hispanic Females (*n*=82) | | | |
| Media use (Wave 1) | .48 | .28 | 2.96 | .09 | 1.62 |
| SES | .01 | .12 | .00 | .95 | 1.01 |
| $X^2$ | 3.09 | | | | |
| *df* | 2 | | | | |

*$p < .05$. **$p < .01$.

Appendix D

*Adjusted Relative Risks of Vaginal Sex Initiation of Same-Sex-Attracted Participants by Race-by-Gender Subgroup*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio |
|---|---|---|---|---|---|
| | | White Males (*n*=85) | | | |
| Media use (Wave 1) | .38 | .17 | 5.18 | .02 | 1.46 |
| SES | -.02 | .09 | .07 | .80 | .98 |
| $X^2$ | 5.51 | | | | |
| *df* | 2 | | | | |
| | | White Females (*n*=200) | | | |
| Media use (Wave 1) | .06 | .10 | .34 | .56 | 1.06 |
| SES | -.17 | .06 | 8.05 | .01 | .84 |
| $X^2$ | 10.48** | | | | |
| *df* | 2 | | | | |
| | | Black Males (*n*=18) | | | |
| Media use (Wave 1) | .07 | .36 | .04 | .85 | 1.07 |
| SES | -.25 | .18 | 2.00 | .16 | .78 |
| $X^2$ | 2.39 | | | | |
| *df* | 2 | | | | |
| | | Black Females (*n*=51) | | | |
| Media use (Wave 1) | -.33 | .22 | 2.24 | .14 | .72 |
| SES | -.11 | .10 | 1.27 | .27 | .90 |
| $X^2$ | 3.06 | | | | |
| *df* | 2 | | | | |
| | | Hispanic Females (*n*=29) | | | |
| Media use (Wave 1) | .02 | .23 | .00 | .95 | 1.02 |
| SES | -.12 | .14 | .68 | .41 | .89 |
| $X^2$ | .80 | | | | |
| *df* | 2 | | | | |

*$p < .05$. **$p < .01$.

Appendix E

*Adjusted Relative Risks of Oral Sex Initiation of Same-Sex-Attracted Participants by Race-by-Gender Subgroup*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio |
|---|---|---|---|---|---|
| | | White Males (*n*=78) | | | |
| Media use (Wave 1) | .03 | .14 | .05 | .82 | 1.03 |
| SES | .02 | .08 | .07 | .80 | 1.02 |
| $X^2$ | .10 | | | | |
| *df* | 2 | | | | |
| | | White Females (*n*=182) | | | |
| Media use (Wave 1) | -.07 | .11 | .47 | .49 | .93 |
| SES | .00 | .06 | .00 | .97 | 1.00 |
| $X^2$ | .54 | | | | |
| *df* | 2 | | | | |
| | | Black Males (*n*=15) | | | |
| Media use (Wave 1) | -.06 | .33 | .86 | .94 | .49 |
| SES | .00 | .19 | .00 | 1.00 | .70 |
| $X^2$ | .04 | | | | |
| *df* | 2 | | | | |
| | | Black Females (*n*=48) | | | |
| Media use (Wave 1) | .07 | .21 | .11 | .75 | 1.07 |
| SES | .19 | .10 | 3.61 | .06 | 1.21 |
| $X^2$ | 3.71 | | | | |
| *df* | 2 | | | | |
| | | Hispanic Males (*n*=13) | | | |
| Media use (Wave 1) | -.57 | .60 | .93 | .34 | .56 |
| SES | -.12 | .18 | .41 | .52 | .89 |
| $X^2$ | 1.41 | | | | |
| *df* | 2 | | | | |
| | | Hispanic Females (*n*=27) | | | |
| Media use (Wave 1) | .10 | .21 | .23 | .64 | 1.11 |
| SES | .13 | .14 | .89 | .35 | 1.14 |
| $X^2$ | .96 | | | | |
| *df* | 2 | | | | |

*$p < .05$. **$p < .01$.

Appendix F

*Adjusted Relative Risks of Anal Sex Initiation of Same-Sex-Attracted Participants by Race-by-Gender Subgroup*

| Variable | Coefficient (β) | Standard Error | Wald $X^2$ | *p* Value | Hazard Ratio |
|---|---|---|---|---|---|
| | | White Males (*n*=77) | | | |
| Media use (Wave 1) | .10 | .19 | .25 | .62 | 1.10 |
| SES | .12 | .11 | 1.15 | .28 | 1.12 |
| $X^2$ | 1.20 | | | | |
| *df* | 2 | | | | |
| | | White Females (*n*=186) | | | |
| Media use (Wave 1) | -.05 | .14 | .14 | .70 | .95 |
| SES | .09 | .08 | 1.14 | .29 | 1.09 |
| $X^2$ | 1.59 | | | | |
| *df* | 2 | | | | |
| | | Black Males (*n*=15) | | | |
| Media use (Wave 1) | -.73 | .38 | 3.73 | .05 | .48 |
| SES | -.08 | .22 | .14 | .71 | .93 |
| $X^2$ | 3.95 | | | | |
| *df* | 2 | | | | |
| | | Black Females (*n*=51) | | | |
| Media use (Wave 1) | .09 | .28 | .10 | .75 | 1.09 |
| SES | .44 | .17 | 6.28 | .01 | 1.55 |
| $X^2$ | 6.83* | | | | |
| *df* | 2 | | | | |
| | | Hispanic Males (*n*=13) | | | |
| Media use (Wave 1) | -.89 | .65 | 1.91 | .17 | .41 |
| SES | -.00 | .22 | .00 | .99 | 1.00 |
| $X^2$ | 2.03 | | | | |
| *df* | 2 | | | | |
| | | Hispanic Females (*n*=27) | | | |
| Media use (Wave 1) | .01 | .26 | .00 | .96 | 1.01 |
| SES | -.04 | .16 | .05 | .83 | .97 |
| $X^2$ | .06 | | | | |
| *df* | 2 | | | | |

*$p < .05$. **$p < .01$.