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**A PERSON-CENTERED APPROACH TO ONLINE SEXUAL EXPERIENCES AND
OFFLINE SEXUAL AND SUBSTANCE USE BEHAVIORS AMONG FEMALE
ADOLESCENTS**

A Doctoral Dissertation in
Human Development & Family Studies

by

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Abstract

Adolescents spend a substantial amount of time on internet-connected devices (Refuel Agency, 2015), yet little is known about how adolescents use this new online context for sexual purposes or how individual differences in usage predict later outcomes. In addition, female adolescents have a unique experience of sexual socialization in both online and offline contexts compared to male adolescents, as there are contradictory cultural norms which encourage female adolescents to prove their sexual attractiveness but shame them for engaging in sexual behavior (Bay Cheng, 2015). To further complicate the issue, maltreated female adolescents face even more difficulty during adolescent sexual development as they process past trauma or navigate their world without sound parental guidance (Noll et al., 2013). Consequently, the internet becomes a space for sexually developing female adolescents to learn as well as practice sexual scripts, or cultural rules about sexual behavior and attitudes. Much of the research that examines online sexual behaviors among adolescents takes a variable-centered approach which lacks complexity to capture the multidimensionality of online sexual behavior, as these behaviors do not occur in isolation. Thus, this dissertation used a person-centered approach, latent class analysis (LCA), to identify patterns of a broad range of online sexual experiences (referred to as classes) to explore offline sexual behavior and substance use correlates among female adolescents specifically. Then, established classes were used to differentially predict later HIV risk, teen dating violence (TDV), and sexual assault to examine how class structure, distribution, and prediction differs between maltreated and non-maltreated female adolescents. Female adolescents ($N = 312$, mean age = 15.21, 45% Caucasian) who were participating in the cross-sequential Female Adolescent Development Study (FADS) filled out questionnaires across 2-5 years from approximately 14-19 years old. Nearly half had experienced substantiated maltreatment that was verified through child protective services. In study 1, a LCA was performed in Latent Gold 5.0. Based upon fit statistics and selection criteria, a four-class model was selected with the following classes: *Online Abstinent*, *Online Inclusive*, *Attractors*, and *Seekers*. Maltreated participants were more likely to have engaged in most online and offline sexual behaviors than non-maltreated participants. The same four classes were observed in both maltreated and non-maltreated participants. However, maltreated female adolescents were more likely to be members of the *Online Inclusive* class than any other class. In study 2, established latent classes from Study 1 differentially predicted HIV risk, TDV, and sexual assault one year later. The *Attractors* class was more likely to engage in HIV risk behavior and to experience TDV and sexual assault one year later compared to the *Online Abstinent* class. Maltreatment status moderated the prediction of sexual assault by class membership such that maltreated female adolescents in the *Online Inclusive* class were more likely to be sexually assaulted than non-maltreated female adolescents in the *Online Inclusive* class. Taken together, these studies suggest that interventions that target online sexual experiences should (1) focus on characteristics that make individuals vulnerable to online experiences instead of approaching online risk as a global issue for all adolescents, (2) address maltreatment as a unique risk factor for online and offline sexual experiences, and (3) tailor messages and programming as different adolescents are differentially at risk for future outcomes.

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Chapter 1: Introduction

Background and Significance

On average, adolescents in the US spend 11 hours a day engaged with various media on internet-connected devices, which is more than time spent in school or interacting with parents (Refuel Agency, 2015). Online digital media offer youth more opportunities to create, share, and consume content as well as to communicate with peers and strangers than ever before through traditional media (Ward, Seabrook, Manago, & Reed, 2016; Ybarra & Mitchell, 2008), providing a new context for the transmission, processing, and *practicing* of culturally-determined norms for sexual behavior, known as sexual scripts (Simon & Gagnon, 1984), during adolescence. Together, the proposed studies seek to elucidate individual differences in how sexual scripts are processed and practiced for female adolescents within an online digital media context.

The proposed studies move beyond cross-sectional, variable-centered approaches that simply examine how one behavior is associated with another, by identifying nuanced patterns of several online sexual experiences (e.g. internet pornography use, sexual self-presentation on social media, and sexting) with a person-centered approach. A person-centered approach identifies patterns of behaviors instead of focusing on one behavior at a time, as a variable-centered approach would (Bergman & Magnusson, 1997). Further, the proposed studies will examine how offline sexual behaviors (e.g. age at first vaginal sex, engagement oral sex, and number of sex partners) correspond to those experiential patterns as well as how those experiential patterns predict later sexual health and victimization. Differences in the prediction of sexual health and victimization outcomes by those earlier patterns will be examined between maltreated and non-maltreated adolescents. The person-centered approach of this dissertation provides a holistic picture of adolescent sexual development in an online context by identifying

types of individuals who are at heightened risk for maladaptive sexual health and violence outcomes and in most need of intervention. Such knowledge would provide necessary information to bolster sexuality education (Haberland & Rogow, 2015) and internet safety programs, which currently do not address online sexual experiences in depth.

Definition of Terms

The following definitions are provided to ensure uniformity and understanding of these terms throughout the study. I developed all definitions that not accompanied by a citation.

Internet pornography use: “Professionally produced or user-generated pictures or videos (clips) intended to sexually arouse the viewer” (Peter & Valkenburg, 2011, pp. 1015-1016).

Proteus Effect: When an individual alters behavior to be consistent with their online persona or avatar (Yee & Bailenson, 2007).

Provocative self-presentation: Presenting oneself in a visually sexualized manner in an online profile.

Reproductive coercion: A partner who is purposely sabotaging contraception in order to control the timing or outcome of pregnancy in the other partner (Miller et al., 2014).

Revenge porn: Nude imagery or video that is shared publically, with malicious intent, without the depicted person’s consent.

Sexting: Sending nude images via an internet-connected device (Crimmins & Seigfried-Spellar, 2014).

Sexual abuse: Unwanted sexual activity, with perpetrators using force, making threats or taking advantage of victims not able to give consent (APA, 2016).

Sexual assault: Any type of sexual contact or behavior that occurs without the explicit consent of the recipient. Falling under the definition of sexual assault are sexual activities such as forced sexual intercourse, forcible sodomy, child molestation, incest, fondling, and attempted rape (DOJ, 2016).

Sexual exploitation: Posting nude images online without consent, selling webcam sex, or luring one into sex trafficking (Mitchell, Finkelhor, Jones, & Wolak, 2010).

Sexual risk taking: Engaging in sexual behavior with the potential to experience a negative life-long consequence-such as an unwanted pregnancy or sexually transmitted infection.

Sexual Scripts: Rituals and norms which include gendered sexual behavior standards, courtship rituals, and standards of beauty (Simon & Gagnon, 1984).

Sexual Self: The sense of oneself as a sexual person (O'Sullivan, Meyer-Bahlburg, & Mckeague, 2006).

Sexual solicitation: Unwanted requests to engage in offline sexual behavior (Mitchell, Finkelhor, & Wolak, 2007a).

Social Media: A group of internet-based applications and websites that allow for the creation and exchange of user-generated content, such as Facebook®, Twitter®, Instagram®, or Vine® (Kaplan & Haenlein, 2010).

Sexual victimization: Having had experienced sexual abuse or sexual assault.

Teen Dating Violence (TDV): A pattern of behavior during adolescence that includes physical, emotional, or verbal abuse used by one partner in a romantic relationship to exert power and control over another (O'Keefe, 2005).

Conceptual Framework

Sexual scripting theory.

Sexuality is a complex aspect of development, which is derived from both biologically-initiated mechanisms, as well as culturally-initiated rituals and norms. These rituals and norms include gendered sexual behavior standards, courtship rituals, and standards of beauty; known as 'sexual scripts' (Simon & Gagnon, 1984). Accordingly, Sexual Scripting Theory (Simon & Gagnon, 1984) posits that sexuality goes beyond biology, explaining that cultures develop unique traditions and rules that make-up a 'script' to perform sexuality.

Sexual scripts interact on cultural and intrapersonal levels, providing influence on an individual's sexual attitudes and behaviors (Gagnon & Parker, 1995; Simon & Gagnon, 1986). Traditionally, sexual scripts were taught by parents and religious leaders and reinforced by peers (Katchadourian, 1990). However, in today's digital and media-enhanced society, sexual scripts are also transmitted through the sexual models displayed in traditional media such as movies, magazines, television, and more recently, through digital media such as social and sexual media on the internet. Sexual scripts provide a cognitive schema of what constitutes normative sexual attitudes and behavior as well as a framework for which an individual interprets sexual scripts and applies them to their self, as they develop their sexual self, or sense of their self as a sexual person (Dworkin & O'Sullivan, 2005; Impett, Schooler, & Tolman, 2006).

Female adolescent sexual development and sexual scripts.

Heterosexual female adolescents have a distinct experience when it comes to sexual development from heterosexual male adolescents within our culture due to gendered norms of sexuality. Gender is not a context, but a social identity that is attributed by others to take on a

particular meaning *within* a socially constructed context (Côté, 2009). Therefore, adolescents act in ways that are consistent with the *meaning* of their gender in order to play that role in the context of peers, family, and school. Boys and men receive cultural messages about the sexual meaning of their gender through parents, peers, schools, and media that allow greater sexual freedom than the messages geared toward girls and women, known as the sexual double standard (Crawford & Popp, 2003). Specifically, boys and men are expected to play an active role in sexual behaviors and presentation, whereas girls and women are encouraged to be more sexually passive (Tolman, Striepe, Harmon, & 2003). Indeed, the primary female sexual script is that sex is okay, as long as it occurs in the context of a relationship and is initiated by a male partner (Impett et al., 2006); but above all else, sexual worth must be proven through aesthetic expression of sexuality (Bay-Cheng, 2015; Shibley-Hyde & Durik, 2000; Tolman, 2002). This juxtaposition suggests that displaying sexual attractiveness is the most socially appropriate way for female adolescents to express their sexuality, because it is a behaviorally passive way to engage sexually (Bay-Cheng, 2015; Tolman et al., & 2003). Research has shown that the endorsement of this sexual double standard is associated with having more sexual partners (Lefkowitz, Shearer, Gillen, & Espinosa-Hernandez, 2014), using alcohol before sex (Boone & Lefkowitz, 2004), as well as perceiving female-initiated condom use negatively (Kelly & Bazzini, 2001). These studies suggest that gendered sexual scripts play a role in sexual health, making it necessary to investigate gendered experiences in sexual development. Therefore, this dissertation seeks to understand how female adolescents seek out sexual information or display their sexual selves online as part of their sexual development.

Sexual scripts on the internet.

The internet has become the central vehicle for the transmission of sexual scripts through the distribution of pornography, and has altered the way in which individuals use pornography (Cooper, Delmonico, & Burg, 2000). The “triple-A engine” is thought to explain why internet pornography use is more prevalent than pornography use through other mediums in the last decades (Cooper et al., 2000). The internet makes pornography *available*, because nearly everyone has internet access; the use of pornography has become *anonymous*, because one can access pornography without anyone else becoming aware; and the internet makes pornography *affordable*, because one no longer has to spend upwards of 60 dollars on a VHS or DVD as the majority of internet pornography is free (Cooper et al., 2000). Consequently, exposure to and even frequent use of internet pornography is relatively common among adolescents today (Owens, Behun, Manning, & Reid, 2012; Ševčíková & Daneback, 2014). It is important to note that internet pornography use is conceptualized here as “professionally produced or user-generated pictures or videos (clips) intended to sexually arouse the viewer” (Peter & Valkenburg, 2011, pp. 1015-1016). Unfortunately, content analyses show the majority of the most frequented pornographic websites and purchased pornographic DVDs portray verbal and physical aggression toward women (Barron & Kimmel, 2000; Bridges, Wosnitzer, Scharrer, Sun, & Liberman, 2010; Klaassen & Peter, 2015), sparking concern over the likelihood of adolescents’ inability to process these violent sexual scripts. Furthermore, individuals experience sexual arousal while watching pornography regardless of depictions of aggression, however, women are more likely to report psychological distaste than men (Allen et al., 2007; Glascock, 2005), likely making the experience of using pornography confusing for sexually developing female adolescents.

Although a great deal of female adolescents report being exposed to internet pornography unintentionally, many report that they value internet pornography for both arousal and education (Vanwesenbeeck et al., 2006). Parents often underestimate the degree to which their children, particularly girls, are exposed to internet pornography (Byrne, Katz, Lee, Linz, & McIlrath, 2014). Research has shown that parental control software can decrease the incidence of unwanted exposure to pornography among younger adolescents ages 10-15 (Ybarra, Finkelhor, Mitchell, & Wolak, 2009). However, monitoring software is not as effective for older adolescents and only 30-75% of homes utilize some type of monitoring and filtering software (Ybarra et al., 2009). Parents often intend to use monitoring software but are inconsistent in practice (Tsai, Wei, & Tsai, 2014). Furthermore, many adolescents access the internet on unmonitored mobile devices such as smartphones and tablets (Refuel Agency, 2015). Therefore, the ubiquity of internet pornography facilitates both unwanted and wanted exposure to internet pornography, despite parental control efforts, providing a consistent source for the observation of sexual behavior for adolescents. Therefore, understanding who uses internet pornography and what other online and offline sexual behaviors pornography use is linked to will expand our knowledge of Sexual Scripting Theory (Simon & Gagnon, 1984) by applying it to a digital context as adolescents both consume and create sexual media online. Further, this dissertation will illuminate how female adolescents both process and practice sexual scripts online in differing patterns that may need different types of monitoring and/or intervention and to identify who is most vulnerable to subsequent victimization or poor sexual health outcomes of such online exploration (see figure 1).

Social cognitive theory of mass communication.

During the onset of physical sexual maturation, adolescents develop an increased interest in sexuality (Weinstein & Rosen, 1991) and further assume cultural sexual scripts (Gagnon & Simon, 1984). Although it is developmentally appropriate for female adolescents to be curious about sex, to seek out sexual information, and to be sexually aroused (O'Sullivan, 2014), it is unclear if use of technology is aiding in healthy gratification of these needs or if it is promoting risky sexual behavior (e.g. sex without condom use) and sexual victimization (e.g. sexual assault from someone met online). Social Cognitive Theory of Mass Communication (Bandura, 2009), asserts the importance of focusing the attention of media effects on the *receiver* of media and not media specifically. This theory proposes that human behavior is influenced by environmental *and* individual (e.g. affective and cognitive) factors that beget a reciprocal process by which communication influences thought, affect, and action (Bandura, 1986; 2009). Specifically, Social Cognitive Theory of Mass Communication (Bandura, 2009) would posit the influence sexual and social media has on adolescent sexual behavior would depend upon certain characteristics that are unique to the individual. For example, adolescents who perceive internet pornography to be more real also perceive sexual behavior to be a primarily physical (instead of affectionate or relational) act than adolescents who perceive internet pornography to be less real (Peter & Valkenburg, 2010). This finding suggests that one's individual perception will alter the way in which they process internet pornography. However, over the course of three years, the more an adolescent viewed internet pornography, the more they perceived the sexual acts portrayed to be representative of sexual behavior offline (Peter & Valkenburg, 2010), suggesting that the behavior of using internet pornography over time can alter ones' perceptions as well. In sum,

individuals differ in their processing of media based upon individual differences in perception. However, processing of particular media over time could affect an individual's perception

One major developmental task of adolescence is the construction of the sexual self, or the sense of oneself as a sexual person (O'Sullivan et al., 2006). As sexual scripts provide a cognitive schema for what constitutes normative sexual attitudes and behavior, individuals differentiate in their interpretation of sexual messages and application of them to their self, as they develop their sexual self (Dworkin & O'Sullivan, 2005; Impett et al., 2006). The proliferation of sexual and social media online changes the way sexual scripts have been traditionally understood, as adolescents now have the ability to seek internet pornography regularly to learn about sex, but are also able to *practice* sexual scripts through self-presentation on social media or via sexting on mobile apps. This practicing of sexual scripts gleaned from media presents a unique problem for female adolescents, as girls and women are often portrayed as sexualized and permissive in traditional and digital media (Barron & Kimmel, 2000; Grabe & Hyde, 2009; Manago, Graham, Greenfield, & Salimkhan, 2008; Peluchette & Karl, 2009; Ringrose, Harvey, Gill, & Livingstone, 2013; Thiel-Stern, 2009). Furthermore, researchers have found that practiced sexualized and permissive self-presentation online is linked with vulnerability toward sexual victimization (Impett et al., 2006; Noll, Shenk, Barnes, & Putnam, 2009; Ward et al., 2016). Thus, the development of the sexual-self in an online context shows potential for danger, nevertheless there are likely individual differences in the patterns of online and offline sexual behavior that would result in harm. As seen in figure 1, this dissertation will apply Social Cognitive Theory of Mass Communication (Bandura, 2009) by using a person-centered approach to assess individual characteristics in conjunction with media use over time to

analyze the association between individual differences in online sexual and social media use and offline sexual behavior to identify who is in most need of intervention.

Sexual objectification theory.

Sexual Objectification Theory posits that through repetitive representations of sexualized girls and women within a culture, male adolescents learn to treat women as sexual objects, and female adolescents learn to treat themselves as sexual objects instead of multifaceted people (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). For example, prior work has found that the consumption of music television and sexualized reality TV programming is linked with self-objectifying and self-sexualizing behaviors and attitudes for female adolescents (Grabe & Hyde, 2009; Ward et al., 2016), even longitudinally (Aubrey, 2006). Due to the gender-based violent and degrading content of the most viewed and purchased pornography (Barron & Kimmel, 2000; Bridges et al., 2010), consistently consuming such objectifying and sexually aggressive media could begin a process by which female adolescents will internalize the perspective of themselves as sexual objects and potentially present themselves as such on social media profiles.

Consistent with Kaplan and Haenlein (2010), social media is operationally defined here as a group of internet-based applications and websites that allow for the creation and exchange of user-generated content, such as Facebook®, Twitter®, Instagram®, or Vine®. The basis of social media is the social interaction, which gives users the ability to connect and share thoughts in a global space where location is unimportant (Carlsson, 2010). Adolescents primarily use social networking sites in a benign way to connect with friends and romantic partners, to experiment with and develop an individual identity, and to solidify a group identity with peers

(Valkenburg, Schouten, & Peter, 2005). However, classic symptoms of depression may develop after a female adolescent in particular, spends a significant amount of time on social media sites, such as Facebook®, known as ‘Facebook® depression’ (Davila, Stroud, & Starr, 2009). Female adolescents who suffer from Facebook® depression are at risk for social isolation, which is in turn linked with visiting riskier internet sites, such as blogs about substance use or eating disorders (O’Keeffe & Clarke-Pearson, 2011). In general, adolescents who report the most daily use, also report getting into trouble often, are consistently sad, and are frequently bored (Rideout, 2012). Consequently, female adolescents may develop feelings of inadequacy, become socially isolated, or self-objectify through social media usage, making social media use an important platform for the investigation of female sexual development.

Another platform for female adolescents to express their sexuality is through the transmission of sexually explicit (or nude) photos via the internet or mobile device, referred to as “sexting”. The term “sexting” is a mix of the words “texting” and “sex” and appears as a recognized term in Oxford English and Merriam-Webster dictionaries (Jolicoeur & Zedlewski, 2010; Yoshihara, 2013). As mobile technology became increasingly used as a popular way to communicate within social relationships, the practice of sexting steadily became normative among adolescents (Drouin & Landgraff, 2012). Although the most frequently used device for sexting is the mobile phone, tablets and computers also facilitate sexting through social media sites such as Facebook® and Twitter® (Drouin, Vogel, Surbey, & Stills, 2013; Henderson & Morgan, 2011). There is not yet a consensus on how prevalent the act of sexting is among adolescents. For example, 30-40% of adolescents report having received a sext (The National Campaign to Prevent Teen and Unplanned Pregnancy & CosmoGirl.com, 2008; Strassberg et al., 2013). More male (49.7%) than female (30.9%) adolescents report receiving sexts, and

approximately 25% of receivers report forwarding them to other people, despite nearly half declaring that it is wrong to forward nude photos (Strassberg et al., 2013).

Sexting provides anonymity and asynchronicity during communication through computer-mediated communication and therefore more comfort around sexual interaction compared to face-to-face communication (Broadus & Dickson-Gomez, 2013). However, the same technological advances that aid in communication, also aid in digital permanence. Digital permanence introduces new legal and more permanent consequences to be addressed by the field of adolescent sexual development (Judge, 2012), as the act of engaging in sexting can be interpreted as typical sexual curiosity, or as a sign of legal and social risk taking. Given the high stakes of having nude images permanently online, sexting arguably can be considered a self-objectifying behavior, because the adolescent is risking her own wellbeing in order to please another visually. Understanding how sexting behaviors co-occur with other online and offline sexual behaviors and for whom will give a more complete picture of the role sexting plays in adolescent sexual development. Furthermore, this understanding will highlight if and for whom sexting is predictive of offline sexual behaviors that are potentially harmful or if sexting is simply a form of modern day flirting. Accordingly, this dissertation will apply Objectification Theory (Fredrickson & Roberts, 1997) to an online context where female adolescents practice their own self-objectification by creating their own sexual media online, via social media and sexting, providing a cyclical effect as a context for the processing and practicing of sexual scripts (see figure 1).

The proteus effect.

The Proteus Effect (Yee & Bailenson, 2007) suggests that individuals will ‘live up to’ their online personas over time. For example, individuals playing a game in a laboratory and in an online community with self-created avatars performed differently based on the height and attractiveness of the avatar. Specifically, those with taller and more attractive avatars, had better overall performance than those with shorter and less attractive avatars in both contexts (Yee & Bailenson, 2007). In a similar study (Yee, Bailenson, & Ducheneaut, 2009), participants were given either shorter or taller avatars and placed in an immersive online environment. In addition to participants with taller avatars acting more aggressive online, participants with taller avatars also acted more aggressive with participants with shorter avatars while engaged in face-to-face interactions offline. These studies suggest that individuals may ‘perform’ differently online according to their online portrayal, and overtime, may begin to act differently offline in ways that are consistent with that portrayal.

Another context where the Proteus Effect could occur is on social media, where adolescents use social media to project their persona to the world as the largest group of social media users (Refuel Agency, 2015). Female adolescents, rather than male adolescents, more commonly present themselves in a sexually provocative way online (Manago et al., 2008; Thiel-Stern, 2009), suggesting that some female adolescents utilize social media to advertise their sexuality in an objectifying manner. Indeed, 20% to 50% of female adolescent social media profiles contain a sexually provocative image of the user (Crescenzi, Arauna, & Tortajada, 2013; Kapidzic & Herring, 2015). These provocative self-presentations (including provocative avatars and sexualized photos) have been found to be linked with higher offline sexual victimization

rates (Impett et al., 2006; Noll et al., 2009; Ward et al., 2016). For example, female adolescents who chose a provocative avatar to represent themselves in a laboratory experiment were also more likely to experience online sexual solicitations, and in turn, more offline encounters with individuals whose identity is unknown (Noll et al., 2009). This finding suggests that self-objectification and the Proteus Effect could be occurring for female adolescents through their social media use as they interact with others online and offline.

Chatting about sex online offers a seemingly safe place for adolescents to “practice” sexual and romantic interactions, which can be riskier in the real world (Bouchey & Furman, 2003). However, online chatting about sex can also lead to harassment (Barak, 2005) and requests to engage in sexual behavior, known as sexual solicitation and offline victimization such as being coerced into unwanted sex or even sexual exploitation in the form of selling webcam sex or lured into sex trafficking (Mitchell et al., 2007a; Mitchell, Finkelhor, & Wolak, 2007b; Mitchell et al., 2010). These findings suggest the need to apply the Proteus Effect to adolescent online sexuality in a longitudinal manner to determine if online portrayals predict offline behaviors. As seen in figure 1, the Proteus Effect (Yee & Bailenson, 2007) will be applied to the process of adolescent sexual development by examining if female adolescents who participate in more self-objectifying behaviors online are also more likely to be victimized offline at a later time point, indicating the Proteus Effect.

Child maltreatment: Online sexual experiences & offline sexual behavior.

When it comes to the risk for harmful online sexual experiences (such as online harassment) and deleterious reactions to it, adolescents who are most at risk for offline harms, such as those who have been sexually or physically abused or those living in poor home

environments, are also the most vulnerable to online victimization (Berkman Center for Internet and Society, 2008). Although the pathway to harmful outcomes differs for vulnerable youth, a history of maltreatment such as sexual abuse, physical abuse, or neglect is associated with a variety of high-risk online and offline sexual behaviors and outcomes. For example, maltreated youth are more likely to have sexually provocative social media profiles and receive more sexual solicitations than their non-maltreated counterparts (Mitchell et al., 2007a; 2007b; Noll, Shenk, Barnes, & Haralson, 2013). Maltreated female adolescents are also more likely to engage in early sexual debut (Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003; Wilson & Widom, 2011), experience early pregnancy (Noll & Shenk, 2013), experience sexual assault (Noll, 2005), present with compulsive sexual behaviors, and report less contraceptive efficacy (Noll et al., 2003) than their non-maltreated counterparts. Therefore, when determining what constellations of online sexual behaviors are deleterious for offline sexual health and violence outcomes, differences in maltreatment status (see figure 1) will be investigated as maltreatment is an established risk factor for online and offline sexual risk behaviors. We conceptualize risky sexual behavior as engaging in sexual behavior with the potential to experience a negative life-long consequence-such as an unwanted pregnancy or sexually transmitted infection, as sexual behavior in general is normative for female adolescent development (Tolman & McClelland, 2011).

There are several theoretical reasons why maltreatment might complicate sexual scripts. For example, the Traumagenics Dynamics Model (Finkelhor & Browne, 1985) posits that survivors of sexual abuse develop traumatic sexualization and stigmatization that can account for later risky sexual behavior. Examples of traumatic sexualization that are pertinent to but not measured in the current studies, include a child receiving rewards such as attention or gifts in

exchange for developmentally inappropriate sexual behavior, causing the individual to learn to use sexuality as a means of manipulating others or getting needs met; and/or when certain body parts of a child's anatomy are sexualized or fetishized causing the individual to focus their efforts on displaying their bodies for attention. Children who have experienced traumatic sexualization may have distorted misconceptions about their sexual selves, and may be more likely present themselves as sexual objects.

Physical abuse renders female adolescents at risk for different reasons. For example, female physical abuse victims have been shown to be more likely to engage in HIV risk behavior due to lower self-efficacy and experience Teen Dating Violence (TDV) because of childhood pairings of love with betrayal (Milner, 2000; Miniati et al., 2010; Norman, Byambaa, De, Butchart, & Scott, 2012). TDV is defined here as a pattern of behavior during adolescence that includes physical, emotional, or verbal abuse used by one partner in a romantic relationship to exert power and control over another (O'Keefe, 2005). For example, physically abused children have difficulty developing efficacy in a variety of domains because they were unable to stop physical abuse (Milner, 2000; Miniati et al., 2010; Norman et al., 2012). Physical abuse survivors have a sense of betrayal as well as a distorted perception of what a close relationship is, particularly if their perpetrator was a caregiver, causing them to pair betrayal and violence with other close relationships (Milner, 2000; Finkelhor & Browne, 1985; Miniati et al., 2010). Indeed, it is well established that a history of child physical abuse is linked with experience of later TDV (Go'mez, 2011; Hamby, Finkelhor, & Turner, 2012), with TDV. Thus, for female adolescents who have been physically abused, the subsequent low self-efficacy and pairing of abuse with relationships would make them more likely to be physically and sexually revictimized in adolescence.

Finally, for female adolescents who have been neglected, riskier online and offline sexual behaviors may ensue, due to a damaged environment where the parent-child relationship is weak and parental warmth and monitoring is low. For example, children who are neglected do not have close relationships to their parents and report low parental warmth (Erickson & Egeland, 2002). Consequently, parental knowledge of behaviors that their child is engaging in is low. Although parental knowledge of children's behavior is most often what is being measured in studies of parental monitoring (Kerr, Stattin, & Burk, 2010), researchers have found that those who have experienced substantiated neglect likely have parents who are low in parental monitoring (Erickson & Egeland, 2002), and likely parental knowledge. Parental monitoring of child behavior has been shown to be key in the prevention of antisocial behaviors such as violence and substance use, as well as sexual victimization and HIV risk behaviors among maltreated youth (Dishion & McMahon, 1998; Wilson & Widom, 2011). Furthermore, parent-child relationship quality and parental monitoring has been shown to prevent online victimization for maltreated youth, but not the use of computer monitoring software (Noll et al., 2013). Hence, female adolescents who are neglected by their caregivers likely have unfettered online access as well as the liberty to engage in unhealthy offline behaviors.

Although each major subtype of maltreatment likely confers unique risk for disruption in sexual scripting, it is important to note that polyvictimization, or the experience of more than one type of maltreatment, is most often the case within maltreated populations in general, particularly by the onset of adolescence, with differing timing and duration of maltreatment (Adams et al., 2016; Finkelhor, Ormrod, & Turner, 2007; Thornberry, Ireland, & Smith, 2001; Vachon, Krueger, Rogosch, & Cicchetti, 2015). Similar patterns are seen within the maltreated portion of the sample for the proposed studies, making it difficult to discern which types or timing of

maltreatment are predictive of which kinds of deleterious outcomes, as the experience of only one type of maltreatment is rare. Therefore, investigation will not be made into effects from different types of maltreatment. Regardless of maltreatment type, female adolescents who have been maltreated are more likely to engage in risky sexual behavior, seek sexual approval online and offline, and endure revictimization (Cantón-Cortés, Cortés, & Cantón, 2012; Filipas & Ullman, 2006; Noll et al., 2013), highlighting the importance of exploring differences in the associations of online sexual behavior and offline behaviors between maltreated and non-maltreated female adolescents.

Variable-centered vs. Person-centered Approaches

Today, adolescents have the ability to seek out sexual media, such as pornography. They can create their own sexual media, through sexual self-presentations on social media and mobile apps. Subsequently, adolescents receive feedback from others via commenting and chatting on social media and mobile apps. Thus, the online context provides a space to process and practice sexual scripts, creating a dynamic system in which different patterns of development are occurring. These individual differences are reflected in Social Cognitive Theory of Mass Communication (Bandura, 2009), where the manner in which the individual processes media and then behaves differs upon various characteristics that are unique to the individual (e.g. past sexual experiences, temperament, attitudes, etc.). However, research on development typically takes a variable-centered approach, where the main conceptual and analytical unit is the variable (Magnusson, 2003). Data are pooled across individuals, leaving multidimensional differences within individuals undetected. The results are then interpreted by mapping these observations between variables onto hypothetical theoretical constructs (Magnusson, 1985; 2002). Consequently, it is difficult to extrapolate a human experience by modeling and describing

phenomena with variables over individuals (Cairns, 1983, Magnusson, 2002). A person-centered approach involves studying individuals based upon their patterns of variables that are relevant to the phenomenon being studied. Variables are used as components of patterns, but have no meaning in isolation (Magnusson, 2003). They are considered only in the context of relation to the other variables simultaneously (Bergman & Magnusson 1997). In a person-centered approach, the pattern, not the variable, is the relevant aspect of the analysis (Magnusson, 2003). Therefore, a person-centered methodological approach that can encompass a holistic-dynamic system view improves the understanding of the multidimensional way in which adolescents use social networking websites, use internet pornography, and participate in sexting (Bergman & Magnusson 1997; Cairns 1983; Magnusson, 1985).

As more fully explicated in chapters 2 and 3, online sexual experiences can be conceptualized as multidimensional because adolescents engage in a multitude of online sexual behaviors in different combinations, creating experiential patterns that are more or less indicative of risk. In contrast, the majority of research on online sexual experiences has used a variable-centered approach, such as regression, which requires that the association between an online sexual behavior (e.g. pornography use) and offline sexual behavior (e.g., oral sex) be quantified in separate models (Bergman & Trost, 2006). A variable-centered approach can be relevant when initially studying complex phenomena, yet it does not consider the whole, only the sum of its parts. Indeed, structural equation modeling, for example, uses the variance-covariance matrix as the raw data to be explained, whereas a person-centered approach aims to uncover underlying classes of people based on a broad set of characteristics (Bergman & Trost, 2006; von Eye & Bergman, 2003) by uncovering patterns. Latent class analysis (LCA) is one such approach that uses multiple indicators of behaviors simultaneously to identify unique patterns of behaviors.

There is a growing body of research that uses LCA to examine offline sexual behaviors (see Beadnell et al., 2005; Hipwell et al., 2011; Vasilenko, Kuglar, Lanza, & Butera, 2015; Wesche, Lefkowitz, & Vasilenko, 2016). However, there is less work on LCA of online sexual behaviors. LCA is likely a burgeoning method given the effective way it is able to capture the multidimensionality of online and offline sexual behaviors. Consistent with Social Cognitive Theory of Mass Communication (Bandura, 2009), individual patterns of internet pornography use, social media use, and sexting may be more indicative of real-world online sexual experiences and therefore more able to dependably predict offline risk, than uncovering one pattern that is pooled across participants, such as in regression analysis. For example, one study found that sexting was not associated with risky sexual behavior or lower psychological well-being (Gordon-Messer et al., 2013). However, when broken into four categories of sexting (non-sexters, receivers, senders and two-way sexters), associations with participant characteristics emerged. For instance, it was more likely for males than for females to receive a sext without sending one. Sexually active participants were more likely to be two-way sexters than sexually inactive participants. These findings revealed that certain individual factors correspond to different patterns or categories of sexting behavior, which provide a more complete picture of a behavioral profile. It is essential to understand the multidimensional nature of online sexual experiences in order to more fully comprehend the associations and consequences of online sexual experiences with offline sexual experiences, and for whom certain online experiential patterns are more indicative of offline risk taking. This approach allows for uncovering which experiences and which individuals should be targeted to bolster sexual education and internet safety programming.

Prevention & Online Female Sexual Development

Female adolescents' unique experience of sexual development also deserves focused investigation largely because they experience the overwhelming majority of adverse consequences from sexual and romantic experiences, such as gender-based violence (GV), teen pregnancy and sexually transmitted infections (STIs), compared to their male counterparts. Indeed, 1 in 5 girls are sexually abused compared to 1 in 20 boys (Finkelhor et al., 2010). One in 5 women report being raped at some point in their lives compared to 1 in 71 men (Black, Sun, Rohrbach, & Sussman, 2011), with 11.8% of girls being raped in high school compared to 4.5% of boys (CDC, 2012). Among female rape victims, perpetrators are more likely to be intimate partners and family members, whereas among male rape victims, perpetrators are more likely to be acquaintances (Black et al., 2011). These gender differences reveal that girls are not only more likely to be sexually abused and assaulted than boys, but are also typically sexually abused and assaulted by men whom they know well, suggesting a different etiology of sexual violence for girls that prevention needs to account for.

Girls and women are also more likely to suffer life-long consequences from sexual behavior or being sexually victimized, including teen pregnancy or contracting a STI. For example, the overwhelming majority of female adolescents who become mothers take sole responsibility for their offspring (Kimball, 2004). Maltreated female adolescents are five times more likely to become pregnant compared with their non-abused counterparts (Noll & Shenk, 2014). Female adolescents who are in violent relationships are also more likely to experience reproductive coercion (i.e. where a male partner purposefully sabotages contraception in order to control a partner through pregnancy), and become unintentionally pregnant in those relationships (Miller et al., 2014). Similarly, 1 in 4 female adolescents has an STI compared to 1 in 15 boys

(Forhan et al., 2009). In addition, the pathway to HIV for women is different from men. Women with HIV have long histories of sexual violence (Silverman, 2011; Wilson & Widom, 2008), whereas the majority of men with HIV had consensual, unprotected sex with other men (CDC, 2005). These disparities highlight the need for a different approach to teen pregnancy, STI, and HIV prevention for female adolescents.

Finally, female adolescents have unique experiences with online sexual and social media that deserves distinction from that of male adolescents. Many female adolescents who experience TDV, report an experience of some sort of abuse online from their perpetrator (Miller & McCauley, 2013). Female adolescents experience more online sexual solicitation than boys (Ybarra & Mitchell, 2008). Female adolescents are also more likely to be victims of revenge porn (i.e. nude imagery or video that is shared publically without the depicted person's consent.) and online sexual exploitation (Mitchell et al., 2010). Thus, query into the online sexual behaviors of female adolescents deserves focused attention as their offline and online sexual behaviors are different than boys in both process and outcomes.

Prevention programming for sexual health and victimization has been fortified in recent years in terms of addressing female adolescents in particular, but there is much advancement needed in order to prevent GV which overwhelmingly affect girls in comparison to boys (Davis, 2008; Humphrey & White, 2000; O'Keefe, 2005). Additionally, prevention has been too slow to keep pace with the rapid technological advances of online sexual and social media (Haberland & Rogow, 2015). Given the unique experience of female sexual development and the ubiquity of sexual and social media use, a more nuanced approach to understanding how sexual behaviors are grouped together and for whom, will aid in the much-needed advancement of prevention programming to address the needs of today's digital native female adolescents.

Sexual health programs that are aimed specifically at female adolescents are limited and do not address online sexual behavior, but a few have been found to be effective for increasing protective offline sexual health behaviors. Current sexual health programming that addresses gender and sexual health behavior, such as *It's All One* (Skaer & Brundage, 2009) and *FLASH* (2011) focus on gender differences in experiences of teen pregnancy and sexual violence. However, these programs do not teach participants how gender roles impact behavior and how to become aware of gender's potential role in sexual decision making. *Sistering, Informing, Healing, Living, and Empowering (SiHLE)* is a 4 module intervention which emphasizes condom use self-efficacy, but also promotes overall esteem in being female, which has been shown to increase condom use among African American female adolescents (Wingood & DiClemente, 2008). *SiHLE* addresses scripts which dictate that females must be submissive and addresses factors which place women at an economic disadvantage to men and how these factors play into heterosexual behavior.

Safe Dates has been shown to be effective at preventing physical and sexual violence perpetration and victimization, even 4 years later, particularly for adolescents who had experienced prior physical victimization (Foshee et al., 2004). *Safe Dates* consists of 10 sessions with interactive activities and role playing that revolves around distinguishing loving, caring, and safe sexual and romantic scenarios from controlling, abusive, or coercive experiences. However, sexual assault prevention programs that target a general audience seem to be effective in changing attitudes but are less effective in reducing revictimization (Classen, 2005). For maltreated adolescents, programs that are most promising at preventing revictimization appear to have longer and more involved interventions, but remain effective for those who were only moderately (as opposed to severely) victimized (Gidycz et al. 2001a; Gidycz et al., 2001b).

Therefore, a person-centered approach to female sexual development in an online context could provide more insight on what works for female adolescents and maltreated female adolescents specifically.

Prevention programs that address online sexual behaviors are emerging. For example, *Think Before You Text* has 7 modules on the consequences of sexting, but does not challenge the social norms or gender power issues of sexting. Therefore, it's likely that the program would increase knowledge of sexting consequences, and perhaps even intentions of sexting, but it is unlikely that it would prevent sexting given how common sexting without perceived consequences is and how motivated by peer norms it is (Walrave et al., 2015). The gender norms that fuel online sexual behaviors such as sexting, make it necessary to understand female adolescents' unique experience with online sexual behaviors in order to develop prevention programming that will be effective for them.

In sum, female adolescents have a unique experience of sexual development due to cultural norms that emphasize physical beauty and pleasing a partner over sexual health and satisfaction that deserve focused attention (Tolman et al., 2003). These norms contribute to significant sexual health disparities in outcomes from sexual behavior such as STIs and pregnancy, as well as physical and sexual victimization. Thus, given the multifaceted process of female sexual development, online sexuality, and sexual health outcomes, investigation that is aimed at female adolescents specifically will provide much-needed information to bolster prevention programming for female adolescents.

The Proposed Studies

The current proposed studies sought to advance our empirical understanding of online sexual experiences of female adolescents in conjunction with their offline sexual behavior and likelihood for later HIV risk and GV victimization by examining the heterogeneity of online sexual behaviors in two ways:

Study 1 aims.

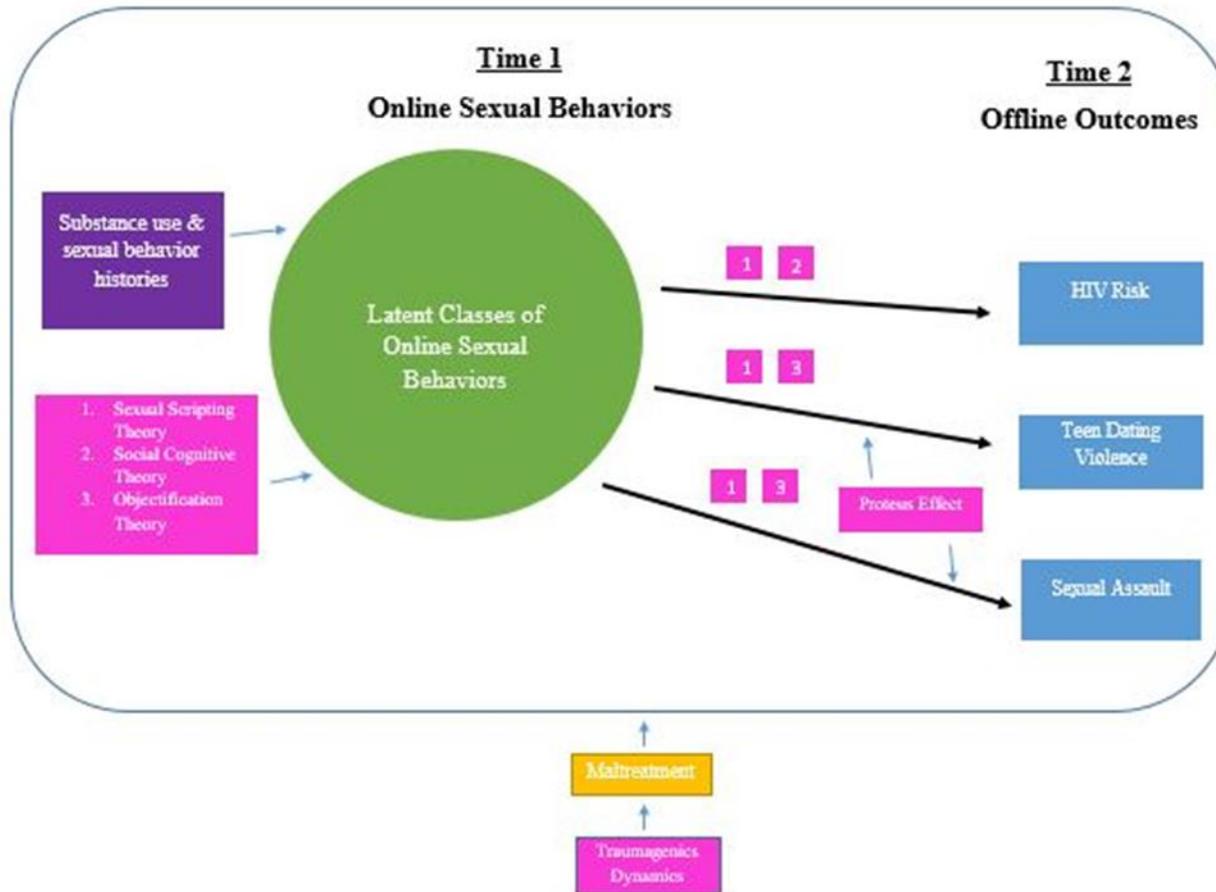
1. Identify different classes of female adolescents that were marked by combinations of online sexual experiences using LCA.
2. Explore differences in class structure and distribution of online sexual experiences between maltreated and non-maltreated female adolescents.
3. Use offline substance use and sexual and romantic behavior correlates to further describe differing classes of online sexual experiences by using LCA with covariates.
4. Apply Sexual Scripting and Objectification Theories to an online context.

Study 2 aims.

1. Use classes of online sexual experiences identified in Study 1 to predict later offline HIV risk and GV victimization outcomes one year later.
2. Examine differences in the prediction of HIV risk and GV victimization by online sexual experience class membership between maltreated and non-maltreated female adolescents.
3. Determine any differences by maltreatment status in the prediction of HIV risk and GV victimization by online class membership.

Both studies furthered prior research by using a person-centered approach to online sexual experiences in order to examine different patterns across an array of online sexual behaviors rather than modeling each behavior across a pool of participants. The person-centered approach taken in this dissertation identified *behavioral constellations* that *certain adolescents* have in order to determine which adolescents are most vulnerable and most resilient when it comes to online and offline sexual behavior development. This approach informs sexual health and victimization programming, as well as internet safety programming, with nuanced information to tailor programs for female adolescents. New programs may be able to address specific types of online and offline sexual risk and/or target specific individuals who are most at-risk.

Figure 1. Overall Conceptual Model



Note. Green = latent classes of online sexual behavior; purple = offline behavioral correlates; pink = theories; yellow = moderator; blue = offline outcomes

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Chapter 2:

A Latent Class Analysis of Online Sexual Experiences and Offline Sexual and Substance Use Behaviors among Female Adolescents

The proliferation of the internet has provided adolescents with unprecedented access to pornography and constant social interaction in ways never before observed prior to the digital era (Ward, Seabrook, Manago, & Reed, 2016; Ybarra & Mitchell, 2008). Indeed, one-half to two-thirds of adolescents have reported exposure to internet pornography, suggesting that exposure may be more normative than previously thought (Owens, Behun, Manning, & Reid, 2012; Sabina, Wolak, & Finkelhor, 2008). Additionally, 73% of American adolescents use social networking websites: over 50% log on to a social networking website daily and 22% log on to them more than ten times per day (Refuel Agency, 2015). Although internet access and social media play such a large role in their daily lives, we do not yet have an adequate understanding of the implications for adolescent social and sexual development.

As adolescents develop an interest in sexuality, they begin to assume culturally constructed norms around sexuality known as 'sexual scripts' (Simon & Gagnon, 1984). Sexual Scripting Theory posits that these culturally constructed sexual scripts are transmitted through parents, peers, and media (Simon & Gagnon, 1984). Ultimately, it is thought that these scripts guide the behavior and expectations an individual has about what his/her role is and how a scene should unfold in a sexual scenario. Objectification Theory further postulates that the predominant sexual script targeted toward female adolescents is that 'physical beauty translates to power,' which may influence girls and women to take an observer's perspective of their physical self as the predominant view of their whole self (Fredrickson & Roberts, 1997). Thus, many female adolescents may feel pressure from this sexual script to prove sexual worthiness

through physical displays of sexuality (Tolman, 2002). Consequently, the online context can become a space for female adolescents to learn sexual scripts and to practice them. For example, ‘sexting’ (i.e., sending nude images via an internet-connected device) and displaying oneself provocatively on social media are both means of practicing sexual scripts, particularly for female adolescents (Crimmins & Seigfried-Spellar, 2014; Strassberg et al., 2013). Thus, research that examines the complexity of online sexual experiences (i.e., experiences that occur online that are sexual in nature) and how those experiences are linked to offline behaviors is vital for our overall knowledge of adolescent sexual development.

Internet Pornography and Sexual Scripts

In addition to offline sources, adolescents can learn sexual scripts through internet pornography use. A well-agreed upon definition for internet pornography that will be used here is “professionally produced or user-generated pictures or videos (clips) intended to sexually arouse the viewer” (Peter & Valkenburg, 2011, pp. 1015-1016). The internet changed the way adolescents are exposed to and use pornography because the internet provides an unprecedented level of access to pornography (Cooper, Delmonico, & Burg, 2000). This accessibility could explain why a recent study of high school students in the US found that students are exposed to pornography online a few times per month, compared with exposure to pornography in movies or magazines a few times per year (Chang et al., 2014). Overall, reports indicate that 40-70% of adolescents are first (and sometimes subsequently) exposed to internet pornography unintentionally (Peter & Valkenburg, 2016), suggesting that exposure to internet pornography is typical for adolescents regardless of their intentions. This level of exposure is concerning because analyses of the most frequented pornographic websites and most purchased pornographic videos reveal that the majority of scenes portray sex with non-committed partners,

without the use of condoms, and with verbal and physical aggression toward women (Barron & Kimmel, 2000; Bridges, Wosnitzer, Scharrer, Sun, & Liberman, 2010; Klaassen & Peter, 2015). Because internet pornography equates risky or violent sex with uniformly positive outcomes, it has the potential to be a defining agent in the formation of sexual scripts. Thus, protection from, or discussion of, these themes is warranted, as most adolescents are not developmentally prepared to deconstruct the kinds of sexual behaviors depicted in media (Chapin, 2000; Peter & Valkenburg, 2016).

Internet pornography use has been found to be associated with riskier sexual attitudes and behaviors among many adolescents in both cross-sectional and longitudinal research (Peter & Valkenburg, 2016), suggesting that internet pornography may indeed be a defining agent in the formation of sexual scripts. For example, exposure to internet pornography is associated with more frequent sexual activity for adolescents (Braun-Courville & Rojas, 2009) and less frequent use of contraceptives for sexually active female adolescents (Wingood et al., 2001). In addition, earlier exposure to internet pornography is associated with an earlier onset of sexual behavior for adolescents (Krauss & Russell, 2008). Among female adolescents in particular, internet pornography use has been found to be associated with higher rates of nicotine and alcohol use (Mattebo, Tydén, Häggström-Nordin, Nilsson, & Larsson, 2016). However, more research is needed in order to understand the scope of consumption and whether exposure has any meaningful impact on adolescent sexual scripts. For example, the use of pornography in conjunction with other online sexual experiences may differ between individuals and may further explain associations between pornography use and negative sexual outcomes.

Social Media, Sexting, and Sexual Scripts

The advent and popularity of social media have sparked a new context for adolescent social development. Social media are a group of internet-based applications and websites that allow for the creation and exchange of user-generated content (Kaplan & Haenlein, 2010). Social media provide adolescents with the opportunity to learn and practice sexual scripts by observing and interacting with peers and non-peers. Indeed, some adolescents use social media to chat about sex with peers and strangers, as a context to present themselves sexually, and/or to distribute sexually suggestive images of themselves (Doornwaard, Moreno, van den Eijnden, Vanwesenbeeck, & Ter Bog, 2014; Perloff, 2014; Van Oosten, Peter, & Boot, 2015). Several studies have shown that female adolescents, compared to male adolescents, more commonly present themselves in a sexually provocative way on social media sites (Bailey, Steeves, Burkell, & Regan, 2013; Kapidzic & Herring, 2015; Manago, Graham, Greenfield, & Salimkhan, 2008; Thiel-Stern, 2009). In accordance with Objectification Theory (Fredrickson & Roberts, 1997), this gender difference in online sexual self-presentation suggests that some female adolescents utilize social media to advertise their sexuality in an objectifying manner; that is, a manner in which the female adolescent displays her physical self for validation of her whole self.

Consistent with Objectification Theory (Fredrickson & Roberts, 1997), girls and women often feel pressure to present themselves in a sexualized and permissive way online that is consistent with the way girls and women are presented in media (Aubrey, 2006; Peluchette & Karl, 2009; Ringrose, Harvey, Gill, & Livingstone, 2013; Thiel-Stern, 2009; Vandenberg & Eggermont, 2012; Ward et al., 2016). In experimental research, young girls (5-8 years old) have been shown to internalize and apply body ideals portrayed by the media to their own bodies (Dohnt & Tiggemann, 2006). Thus, it is unsurprising that some female adolescents feel pressure

to have a sexy or at least a pretty Facebook® profile picture (Peluchette & Karl, 2009). Indeed, 20%-50% of female adolescents display a sexually provocative image on their social media profiles (Crescenzi, Arauna, & Tortajada, 2013; Kapidzic & Herring, 2015). Therefore, female adolescents have a unique online sexual experience due to the sexual objectification they endure.

Sexting also serves as a new platform to practice sexual scripts for adolescents, with female adolescents arguably at higher risk for negative psychosocial outcomes. Sexting through the internet or mobile apps is perceived among many youth to be a modern form of flirting or expressing romantic interest in someone (Baumgartner, Valkenburg, & Peter, 2010; Gordon-Messer, Bauermeister, Grodzinski, & Zimmerman, 2013; O'Sullivan & Ronis, 2012; Strassberg et al., 2013). However, scholars have found sexting to be associated with having more penetrative and oral sex partners, an earlier onset of sexual behavior, lower likelihood of using a condom during penetrative sex, and a greater likelihood of having engaged in sex under the influence of drugs or alcohol (Crimmins & Seigfried-Spellar, 2014; Henderson & Morgan, 2011). Female adolescents report feeling pressured to send sexts and face more consequences after doing so, whereas male adolescents report feeling pressured to collect sexts and gain social power by doing so (Ringrose, Harvey, Gill, & Livingstone, 2013; Walker, Sanci, & Temple-Smith, 2012). Indeed, more male (49.7%) than female (30.9%) adolescents report receiving sexts, and approximately 25% of male receivers (compared with 2% of female receivers) report forwarding them to other people, despite nearly half male receivers declaring that it is wrong to forward nude photos (Strassberg et al., 2013). Thus, female adolescents may be at higher risk for negative psychosocial outcomes from sexting, as their nude photos are more likely to circulate widely.

The speed and ease of forwarding sexts to peers and strangers through various forms of social media make it more likely for public humiliation to occur for the female senders than the male receivers (Thomas, Connor, & Scott, 2014). Even within the context of a committed relationship, the majority of girls are judged as ‘sluts’ for sexting or ‘prudes’ for refusing to sext, whereas boys remain immune from criticism regardless of sexting behaviors (Lippman & Campbell, 2014). Thus, sexting could be considered a self-objectifying behavior for females where it is more important to receive approval for physical and sexual appeal than to prevent negative outcomes such as mass distribution of a nude photo. Understanding social media self-presentation and sexting as potential agents for self-objectification is important because self-objectification has been linked with a number of negative health outcomes such as depression, anxiety, disordered eating, substance use, and less condom use (Carr & Szymanski, 2010; Grabe & Hyde, 2009; López-Guimerà, Levine, Sánchez-Carracedo, & Fauquet, 2010). Therefore, more empirical research is needed to understand (1) whether or not social media and sexting negatively impact female sexual development and (2) which female adolescents might be most vulnerable to online sexual experiences.

The Role of Maltreatment

Understanding which adolescents are prone to higher-risk online sexual experiences will help to illuminate who needs targeted intervention when it comes to internet safety and sexuality education. A growing body of research points to childhood maltreatment (i.e., sexual abuse, physical abuse, and neglect) as a risk factor for a multitude of negative adolescent outcomes, especially in the context of sexual risk-taking (both offline and online). For instance, research has shown maltreated youth are more likely to abuse substances and pair substance use with sexual behavior than non-maltreated youth (Norman, Byambaa, De, Butchart, & Scott, 2012;

Trickett, Noll, Reiffman, & Putnam, 2001; Wilson & Widom, 2011). Furthermore, sexual assault and sexual behavior without the use of contraceptives is more likely to occur among maltreated youth (Noll, Trickett, & Putnam, 2003; Norman et al., 2012; Trickett et al., 2001). Importantly, female adolescents who have been maltreated have also been shown to be more likely to present themselves provocatively online, as well as more likely to agree to an offline meeting with someone whose identity was never confirmed online (Mitchell, Finkelhor, & Wolak, 2007a; 2007b; Noll et al., 2013; Noll et al., 2009). Given this heightened risk for aberrant online and offline behavior, it is crucial to ascertain the risk that maltreatment confers for the development of aberrant sexual scripts.

All types of maltreatment may result in distorted sexual script formation and self-objectification. However, the pathways to these outcomes may be mediated by different factors depending on the type of maltreatment experienced. For example, children who have experienced sexual abuse may have distorted perceptions of their sexual selves and may be drawn to sexual experiences that are more likely to result in negative outcomes (Noll et al., 2003). In contrast, children who have experienced physical abuse may have low self-esteem and self-efficacy and may set themselves on trajectories of general self-destruction and risk-taking, including sexual risk-taking (Kim & Cicchetti, 2006; Milner, 2000; Miniati et al., 2010; Norman et al., 2012). Finally, children who have experienced neglect may have weak parent-child relationships and household environments with low parental warmth and monitoring (Erickson & Egeland, 2002). Types of maltreatment (i.e., sexual abuse, physical abuse, and neglect) co-occur in more than 50% of individuals who experience any type of maltreatment (Adams et al., 2016; Vachon, Krueger, Rogosch, & Cicchetti, 2015). This co-occurrence makes it difficult to disentangle which types of maltreatment are associated with which risky online and offline

sexual behaviors. However, given the vulnerability of maltreated youth, the current study uses maltreatment status as a moderator to determine how maltreatment shapes the size and structure of online sexual experience profiles.

The Value of a Person-Centered Approach to Online Sexual Behavior

A person-centered approach focuses on particular *patterns* of behaviors that occur concurrently, as opposed to a variable-centered approach that emphasizes single behaviors (Bergman & Trost, 2006; Magnusson, 2003). Examining adolescent sexual behavior using a person-centered approach is important insofar as single behaviors may not be risky on their own but rather in combination with other behaviors. Consequently, a person-centered approach will build upon prior variable-centered work by describing adolescent online sexual behavior holistically and emphasizing key patterns of behaviors that occur among female adolescents. Latent class analysis (LCA; Collins & Lanza, 2010; Goodman, 1974) is a person-centered approach that can be used to identify classes of adolescents based on combinations of online sexual experiences to explore the multifaceted nature of adolescent online sexual experiences. LCA has been used in previous studies to identify adolescents' different patterns of sexual and romantic relationships (Vasilenko, Kugler, & Lanza, 2015) and perceived consequences of those patterns (Vasilenko, Kuglar, Lanza, & Butera, 2015; Wesche, Lefkowitz, & Vasilenko, 2016), as well as to investigate violence exposure among women (Nurius & Macy, 2008). However, less is known about different patterns of adolescent online sexual experiences given the lack of person-centered approaches applied to the study of online sexual behavior. A person-centered approach can uncover which female adolescents are more vulnerable to media influences by adequately capturing differences in patterns of online sexual behaviors and their associations with offline outcomes. This approach will provide essential information about how certain online sexual

experiences co-occur and are linked to offline outcomes that can improve sexuality education and internet safety programs.

Given the complexities of the internet and social media behaviors described above, and the fact that internet access provides avenues for both pornography exposure and social media access simultaneously, it is likely that many adolescents have a constellation of experiences as opposed to having these experiences in isolation. There is a burgeoning body of work (for examples see Noll, Shenk, Barnes, & Haralson, 2013; Noll, Shenk, Barnes, & Putnam, 2009; Peter & Valkenburg, 2016) that has examined how various online sexual experiences are linked to antecedents and consequences as singular variables (e.g., internet pornography use or sexting). However, there may be combinations of experiences that pose more imminent risk than other combinations. For example, some adolescents may intentionally seek out pornography and actively engage in sexual discourse whereas others may be the recipients of sexual discourse by attracting others, and still others may not have any of these experiences. Consequently, each of these combinations may be associated with different offline risk behaviors. A person-centered approach will allow us to categorize online sexual experiences in such a way that will illuminate individuals in need of specified interventions, whereas prior variable-centered approaches identified behaviors that may only be in need of intervention for certain unknown people who are lost in the aggregated data that are pooled across all participants. Given the dearth of empirical knowledge in this area, more work is needed in order to further understand the role of the online context in female sexual development and adequately inform current sexuality education and internet safety efforts that address online context.

The Current Study

The current study builds upon prior variable-centered research to investigate the complexity of individual differences in online sexual experiences, how these experiences differ for maltreated youth, and how offline behaviors correlate with these experiences. Given the sexual objectification that female adolescents experience both online and offline compared to male adolescents (Ringrose et al., 2013; Ward et al., 2016), the current study focuses solely on female adolescents. The current study will investigate the role of maltreatment as a critical factor for understanding sexual development in an online context in order to begin to articulate how sexual health and online safety interventions should be augmented to address the unique vulnerabilities that maltreated youth face. However, given the high rates of overlap in the experience of childhood sexual abuse, physical abuse, and neglect (Adams et al., 2016; Finkelhor et al., 2007; Thornberry et al., 2001; Vachon et al., 2015), it is difficult to disentangle effects of different types of maltreatment experiences given the comorbidity of maltreatment experiences. Therefore, we explored latent classes with the full understanding that there could be potential differences based on maltreatment type, onset, and duration that were not examined here. LCA was used to uncover classes of female adolescents characterized by different patterns of online sexual experiences, to investigate how class structure and distribution differed by maltreatment status, and to examine how offline sexual and romantic behavior and substance use histories were associated with class membership.

Research Question 1. How do online sexual experiences cluster together into differing patterns?

Hypothesis 1: Consistent with Sexual Scripting and Objectification theories, it is hypothesized that possible classes that are expected to emerge includes adolescents with the following:

1. A high probability of online sexual self-presentation behavior (e.g., sexualized social media presentation and sexting).
2. A high probability of seeking internet pornography and cybersex/role-play experiences, where sexual self-presentation is absent.
3. A low probability of online sexual experiences.

Research Question 2: How does maltreatment status differentially predict online sexual experience class membership?

Hypothesis 2: Due to prior findings that maltreated youth engage in more online sexual behaviors than non-maltreated youth (Noll et al., 2009; 2013), it is hypothesized that female adolescents who have been maltreated will be less likely to be in a class with little to no online sexual experiences, as identified in H1.

Research Question 3: How are offline sexual and substance use behavior histories associated with online sexual experience class membership?

Hypothesis 3: Consistent with Objectification Theory (Fredrickson & Roberts, 1997) and prior work showing that self-objectification is positively correlated with alcohol, nicotine, and other substance use (Carr & Szymanski, 2010), it is hypothesized that participants who have engaged in more offline sexual behaviors and substance use will be more likely to be in classes with more online sexual self-presentation behavior.

Method

Participants

Female adolescents ($N = 312$) were recruited from a large, Midwestern city. Maltreated participants ($n = 154$) were intentionally recruited from local Child Protective Services (CPS)

agencies for having experienced substantiated instances of physical abuse, physical neglect, or sexual abuse via state and local standards. Fifty percent of the maltreated sub-sample experienced multiple types of maltreatment. Given the high percentage of comorbid maltreatment types, analyses will not be carried out by abuse type. Non-maltreated ($n = 158$) participants were recruited through a hospital-based adolescent health center and were matched with maltreated participants on neighborhood, age, race/ethnicity, family income, and family constellation (e.g., one vs. two-parent household). Validated maltreatment assessments (Barnes, Noll, Putnam, & Trickett, 2009) were conducted with all participants and caregivers to determine that non-maltreated participants did not have any prior history of substantiated abuse or neglect. The total sample had a mean age of 15.21 years ($SD = 1.23$). Participants had a median family income level of \$20,000–\$29,000 and 53% came from single-parent households. The total sample had a racial/ethnic make-up of 46% Caucasian, 45% African-American, 8% Bi- or Multi-racial, 0.5% Hispanic, and 0.5% Native American.

Procedures

This study was approved by the Institutional Review Board at a large Children's Hospital Medical Center. Adolescents provided assent and caregivers provided consent for adolescents. Adolescents completed confidential questionnaires via private computers in a laboratory setting to maximize anonymity. Families received approximately \$20 per hour as monetary compensation for their time and participation. Consent to access CPS records for the entire sample was obtained to confirm any substantiated maltreatment in both groups.

Measures

Online sexual behavior indicators.

Online sexual experiences. Eight self-report items were derived to assess online sexual experiences (see Table 1), with possible responses ranging from 0 = “never” to 4 = “very often.” We were interested in deciphering differences in having had certain online sexual experiences or having not had certain online sexual experiences. All eight items had zero-inflated responses, thus we were able to dichotomize responses into 1 = “never” to 2 = “rarely-very often” in order to conduct the LCA.

Offline behavioral covariates.

Sexual and romantic history (See Table 1) variables were assessed with individual items from *The Sexual Attitudes and Activities Questionnaire* (SAAQ; Noll et al., 2003):

Number of lifetime romantic partners. Number of lifetime romantic partners was assessed using one item. Participants were asked, “How many boyfriends/partners have you had in your lifetime?” Participants could respond with any number representing the number of partners. Participants answers ranged from 0-8 romantic partners.

Number of lifetime sexual intercourse partners. Participants who answered “yes” to ever having had voluntary sexual intercourse were asked, “How many different partners have you had sexual intercourse with in your lifetime?” Participants could respond with any number greater than 0 representing the number of partners. Answers were coded as ‘0’ for those who have never had sexual intercourse. Participant answers ranged from 0-5 sexual partners.

Age at first voluntary sexual intercourse. Participants who answered “yes” to ever having had voluntary sexual intercourse were asked, “As best you can recall, how old were you the first time

you had consensual intercourse?” Answers were scored according to risk level such that lower ages received high scores and those who had never had intercourse were given the lowest score. Specifically, answers were coded as 1-19 representing different ages in 6-month increments from (1) older than 21 to (19) younger than 12. For example (5) represents 14 years old and (8) represents 15 ½ years old. Participants were coded as ‘0’ if they never had voluntary sexual intercourse. Thus, all participants were included in this variable and responses ranged from 0-19.

Ever had oral sex. Participants who indicated 1 or more lifetime partners for “given oral sex (mouth on private parts)” or “received oral sex” were coded as ‘1’. Participants who indicated 0 lifetime partners for “given oral sex (mouth on private parts)” and “received oral sex” were coded as ‘0’.

Number of Sexually Transmitted Infections (STIs). Participants were asked a series of separate questions for 6 different STIs (Chlamydia, Gonorrhea, Syphilis, Pelvic Inflammatory Disease [PID], Genital Herpes, and HIV) to determine STI history. Participants were scored 0-6 based on answering “yes” to the question, “Have you ever been diagnosed with _____?”, across the 6 different STIs.

Ever pregnant. Participants who answered “yes” to having ever been pregnant were asked, “How did you know you were pregnant or how was this pregnancy confirmed?” Participants could indicate the following: (1) “I missed my period”; (2) “I felt ill”; (3) “I had a positive over-the-counter pregnancy test”; (4) “The pregnancy was confirmed by a doctor”; or (5) “The pregnancy was never formally confirmed”. Answers were coded as ‘0’ for answering ‘no’ to having ever been pregnant, having missed a period, felt ill, or never formally confirmed a pregnancy and ‘1’ for having had a positive over-the-counter pregnancy test or a pregnancy that was confirmed by a doctor.

Lifetime substance use history (See Table 1) variables were assessed using the *Monitoring the Future* (MTF) national survey questionnaires (Johnston, O'Malley, Bachman, & Schulenberg, 2005). *Cigarette use* was defined as the number of cigarette smoking occasions (from 0 = "none" to 4 = "four times or more"). Participant responses ranged from 0-4. *Alcohol use* was defined by two items reflecting the number of lifetime occasions adolescents had "more than just a few sips of alcohol" and were "drunk or very high from drinking" (from 0 = "none" to 6 = "40 or more"). Participant responses ranged from 0-6. *Marijuana use* was defined as the number of occasions the participant used marijuana. Participant responses ranged from 0 = "none" to 6 = "40 or more".

Analysis Plan

Model specification and identification.

To examine classes of online sexual experiences among female adolescents, we used latent class analysis (LCA), a technique that identifies unique classes of individuals within a population based on their patterns across characteristics (Collins & Lanza, 2010). Using eight observed, binary variables as manifest indicators (see Table 1) of the latent variable 'online sexual experiences', mutually exclusive and exhaustive subgroups were identified, referred to as classes. Class structure and prevalences were described by identifying key response patterns with the latent cluster analysis function in Latent Gold 5.0 (see Vermunt & Magidson, 2005). LCAs with two, three, four, and five latent classes were compared to identify the optimally fitting model; 1000 sets of random starting values were used to ensure maximum likelihood estimate identification for all models.

Model selection.

The optimally fitting model was determined through an examination of fit statistics and model selection criteria and decisions about the parsimony and theoretical interpretability (e.g., the item-response probabilities clearly separated one class from another) of the models. Model selection criteria included the Akaike information criterion (AIC; Akaike, 1974), Bayesian information criterion (BIC; Schwarz, 1978), and bootstrap likelihood ratio test (BLRT; Dziak, Lanza, & Tan, 2014). Better fitting models were indicated by lower values for the AIC and BIC and by a non-significant BLRT.

Model interpretation.

Two sets of parameters were estimated and used to describe the classes of online sexual behavior: class membership probabilities and item-response probabilities (Collins & Lanza, 2010). Class membership probabilities are the expected prevalence rates of the identified classes in the population. An item-response probability is the probability of providing a particular response to a particular item conditional on class membership. For example, the probability of endorsing a specific item taking class membership into account. Item-response probabilities range from 0 to 1, with higher than .5 representing a greater likelihood, and lower than .5 representing a lower likelihood of responding affirmatively to the item. Probabilities greater than .50 are marked in bold to facilitate interpretation. Interpretation of the classes were made based on measurement quality, such as their item-response probabilities (e.g., did one class have a strong likelihood of reporting a specific activity versus another class that was unlikely to report that activity) relative to the frequency of the sample endorsing an item.

LCA with a grouping variable.

Possible maltreatment differences in latent class membership were investigated with the ‘known class’ function in Latent Gold. First, we tested for measurement invariance to determine if class structure was the same for maltreated and non-maltreated adolescents. We fit a freely estimated 4-class model with maltreatment status as a ‘known class’. Then, we fit a 4-class model where measurement invariance was imposed across both groups. Finally, we compared log-likelihood estimates with a likelihood ratio test between the unconstrained and constrained models to determine if the same class structure existed between classes.

Correlates of class membership.

Offline behavioral covariates’ associations with online behavior class membership were tested using LCA with covariates (Collins & Lanza, 2010), which determined how a given score on a covariate was associated with class membership relative to a reference class. To do this, we used the 3-step approach for modeling covariates of latent classes in Latent Gold (Vermunt, 2010). A baseline-category, multinomial logistic regression model was specified to predict latent class membership from 9 offline behavioral covariates, including number of lifetime romantic partners, number of lifetime sex partners, age at first sex, number of STI diagnoses, ever having oral sex, ever having been pregnant, and lifetime number of cigarette, alcohol, and marijuana use occasions.

Results

In Table 1, we present the means, standard deviations and maltreatment differences utilizing matched-pairs t-tests or chi-square tests for all study variables. Maltreated female adolescents were significantly more likely to have visited at least one pornographic website, to

have engaged in cybersex or role-play online, to have had a sexy profile picture, and to have been solicited online for offline sexual behavior. There was a wide range in experiences with offline sexual and substance use behaviors. T-tests and chi-square tests revealed that maltreated participants were more likely to have engaged in all sexual behaviors, except for oral sex, and all substance use behaviors. Maltreated adolescents also had more STIs and were more likely to have been pregnant. Maltreated and non-maltreated adolescents did not differ on ever having experienced oral sex.

Research Question 1: How do online sexual experiences cluster together into differing patterns?

To investigate our first research question, LCA was used in an exploratory fashion to compare models with different numbers of latent classes and select the optimal solution describing multidimensional patterns of online sexual experiences among female adolescents (see Table 2). The BIC and CAIC indicated a 2-class model, but the AIC and aBIC indicated a 4-class model. The BLRT was significant for each additional class (up to 4) added to the model. The addition of the 5th class did not significantly improve model fit, as evidenced by all fit indices. It is common for information criteria to fail to unambiguously select an optimal solution in LCA. Therefore, the theoretical interpretability of the solutions must also be considered. Based on a combination of fit statistics and criteria and the addition of a meaningful pattern of behavior in the 4th class, we selected the 4-class model as optimal (see Table 3).

The first class, the *Online Abstinent* class (52% of the total sample), was comprised of participants who had a low probability of having had engaged in any of the eight online sexual experiences. The second class, the *Online Inclusive* class (19% of the total sample), was comprised of participants who had a high probability of having had all eight online sexual experiences. The third class, the *Attractors* class (15% of total sample), was comprised of

participants who had a low probability of having visited a porn site, engaged in cybersex, chatted with someone online about sex, or engaged in sexting, but had a high probability of having had a sexy profile picture on a social media site, having someone write comments about how sexy they are on their social media profiles, having someone request that the participant send them sexy photos, and having someone solicit the participant online for offline sex. Finally, the fourth class, the *Seekers* class (13% of the sample), was comprised of participants who had a low probability of having engaged in cybersex, engaged in sexting, had a sexy profile picture on a social media site, and had someone soliciting the participant online for offline sex and a high probability of visiting a porn site, chatting with someone online about sex, having someone write comments about how sexy they are on their social media profile, and having someone requesting that the participant send them sexy photos.

Research Question 2: How does maltreatment status differentially predict class membership?

We used LCA with a grouping variable to examine measurement invariance in the latent class structure by maltreatment status. Comparing G^2 statistics in SAS ($\chi^2(36) = 48.11, p > .05$) and $2*\Delta LL$ in Latent Gold ($\chi^2(36) = 46.83, p > .10$) between the freely estimated and constrained models showed that the latent class structure did not differ significantly by maltreatment status. Therefore, the same four classes were observed in both maltreated and non-maltreated participants. The 3-Step, covariate, BCH method in Latent Gold used a Wald test ($W = 19.09, p < .01$) to determine that the distribution of class memberships significantly differed by maltreatment status (see Table 4). Post-hoc pairwise comparisons showed that maltreated participants were more likely to be member in the *Online Inclusive* class ($\chi^2(1) = 10.33, p < .01$) and less likely to be members in the *Online Abstinent* class ($\chi^2(1) = 10.31, p < .01$) than non-maltreated participants were. Maltreatment status did not significantly predict membership in the

Attractors ($\chi^2(1) = 4.94, p > .05$) or *Seekers* ($\chi^2(1) = 5.74, p > .05$) classes. Thus, hypothesis 2 was supported.

Research Question 3: How are offline sexual and substance use behavior histories associated with online sexual experience class membership?

Finally, Table 5 shows associations between offline sexual and substance use history variables and online class membership. We used the 3-step approach for modeling covariates of latent classes in Latent Gold (Vermunt, 2010). A multinomial logistic regression model was specified to predict latent class membership from offline sexual and substance use behaviors. Due to the outcome being latent, posterior probabilities of class membership were saved as part of the 3-step approach and used as the outcome variable. For interpretation purposes, all covariates were standardized to a mean of 0 and a standard deviation of 1. The *Attractors* class was specified as the reference class in order to determine if offline behaviors were more indicative of class membership in classes with certain patterns of online experiences (e.g., attracting or seeking). Results indicated whether the probability of being a member of another class compared to being a member of the *Attractors* class differed based on level of a covariate. Compared to the *Attractors* class, class membership in the three other classes significantly differed ($W = 18.46, p < .00$) based on number of lifetime penetrative sex partners and self-report of sexually transmitted infections, the frequency of cigarette and alcohol use, and whether or not a participant had ever been pregnant). Participants who had more sexual partners were less likely to be members of the *Online Abstinent* and *Seekers* classes than members of the *Attractors* class. Participants who self-reported more STIs were less likely to be members of the *Online Abstinent* class and more likely to be members of the *Online Inclusive* class than members of the *Attractors* class. Participants who were ever pregnant were less likely to be members of the *Online*

Abstinent class and more likely to be members of the *Seekers* class than members of the *Attractors* class. Participants who used cigarettes more frequently were less likely to be members of the *Online Abstinent* and more likely to be members of the *Online Inclusive* class compared to the *Attractors* class. Thus, hypothesis 3 was only partially supported.

Discussion

The present study built upon prior variable-centered work on adolescent sexual experiences by conducting an exploratory and descriptive examination of patterns of online sexual experiences among female adolescents. The use of LCA in this study enabled the identification of different latent classes of online sexual experiences, how class membership differs by maltreatment status, and how offline sexual and substance use behaviors correlate with class membership. Four different patterns of online sexual experiences emerged, and included a low probability of having endorsed any of the eight online sexual experiences (*Online Abstinent*), a high probability of having endorsed all eight online sexual experiences (*Online Inclusive*), and split engagement in specific online sexual experiences (*Attractors* and *Seekers*). Due to the sophistication of LCA, we were able to uncover an unexpected class (*Online Inclusive*) as well as identify different correlates of unique patterns of online sexual behavior. Whereas, traditional interaction analyses, for example, could not afford such results. Although class structure did not significantly differ between maltreated and non-maltreated female adolescents, the likelihood of class membership did, with maltreated female adolescents more likely to be members of the *Online Inclusive* class and less likely to be members of the *Online Abstinent* class than non-maltreated female adolescents. Several offline sexual and substance use behaviors were also correlated with class membership.

In support of hypothesis 1, a class emerged with a high probability of having had engaged in online behaviors that could be considered self-objectifying as well as a high probability of attracting online attention from others. Indeed, the *Attractors* had a high probability of having a sexy profile picture, having others request sexy photos, having others comment on how sexy they are, and having someone make an online request to engage in offline behavior. Although presenting oneself online in a provocative way may be considered sexual exploration, prior research and the current study suggest there might be consequences that have the potential to impact sexual development. For example, online sexual self-presentation is associated with an increase in unwanted sexual solicitation (Mitchell et al., 2007b; Noll et al., 2009) as well as an increase in emphasis on the sexual-self for overall identity formation (Van Oosten, 2015). In partial support of hypothesis 1, a class emerged with high engagement in behaviors that could be considered ‘seeking’ sex online, named the *Seekers*. However, there was not a higher probability of having had engaged in cybersex/role-play in this class as hypothesized. The *Seekers* had a high probability of having used internet pornography, having chatted about sex, having had someone request sexy photos of them, and having had someone comment about how sexy they are online. Thus, the *Seekers* may be curious about sex and seeking information about sex, but they are not yet receiving much attention from others. In support of hypothesis 1, a class emerged with a low probability of having had any of the eight online experiences (*Online Abstinent*). However, we did not expect a class to emerge with a high probability of reporting all eight online sexual experiences (*Online Inclusive*). Having had more self-reported STIs as well as having used cigarettes and alcohol on more occasions was associated with a higher likelihood of membership in the *Online Inclusive* class compared to the *Attractors* class. These findings suggest that ‘attracting’ experiences, or attracting experiences in tandem with ‘seeking’

experiences, are more indicative of offline sexual behavior and substance use than seeking experiences alone.

In partial support of hypothesis 2, maltreated adolescents were more likely to be members of the *Online Inclusive* class and less likely to be members of the *Online Abstinent* class than non-maltreated adolescents. These results are corroborated by prior work which showed a proclivity toward more online risk behaviors for maltreated youth compared to non-maltreated youth (Noll et al., 2009; Noll et al., 2013). Furthermore, having more STI diagnoses is associated with a higher likelihood of membership in the *Online Inclusive* class than the *Attractors* class, which is consistent with prior work which finds maltreatment to be associated with a greater risk for HIV and other STIs (Forhan et al., 2009; Morokoff et al., 2009). It is important to note the act of receiving nude photo requests, especially from an adult male, may exacerbate trauma symptoms among sexually abused youth as they may trigger prior abuse experiences (Briere & Runtz, 1993). Similarly, due to the fact that maltreated youth are more likely to experience sexual and physical revictimization in adolescence and adulthood than non-maltreated youth (Barnes et al., 2009; Go´mez, 2011), internet-initiated victimization should be included in the content of assault prevention programs and integrated into trauma treatments. In addition, our results suggest that perhaps child protective services could provide internet safety information as part of case management and educate caregivers about monitoring online behaviors. Further, mental health professionals delivering evidence based trauma treatments could be educated about the proclivity for maltreated youth to use the internet and social media in ways that might exacerbate trauma symptoms.

Targeted Prevention Implications

Our results suggest differential prevention implications for each class. Having more sex partners, more STIs, or used alcohol on more occasions was associated with a higher likelihood of membership in the *Attractors* class compared to the *Seekers* class or *Online Abstinent* class, providing support for Hypothesis 3. Given the higher likelihood of sexual solicitations and comments for the *Attractors*, our findings suggest that the *Attractors* could benefit from sexual refusal and assertiveness skill building which teaches individuals how to refuse unwanted sexual attention (Kennedy & Jenkins, 2011; Schry & White, 2013). Such knowledge would equip female adolescents to ward off sexual advances from strangers online as well as adhere to their own sexual boundaries offline, potentially including condom use to prevent STIs. In contrast, participants who had ever been pregnant were more likely to be members in the *Seekers* class than the *Attractors* class. Thus, the *Seekers* may benefit from specified pregnancy prevention. A growing body of literature suggests that teen pregnancy prevention is distinct from STI prevention in that the majority of adolescents who become pregnant have lower educational attainment goals and less future orientation, whereas STI diagnoses are not consistently linked with these qualities (Bunting & McAuley, 2004). Therefore, engaging in ‘attracting’ or ‘seeking’ behaviors online could signal the need for differential prevention programming.

Only the *Online Inclusive* and the *Seekers* class visited pornographic websites and having had more STIs and ever been pregnant was associated with a higher odds of class membership, respectively. In accordance with Sexual Scripting Theory (Simon & Gagnon, 1984), this finding suggests that female adolescents in the *Online Inclusive* and *Seekers* classes may benefit from sexual media literacy and to mitigate harmful sexual scripts that are portrayed in internet pornography such as not using a condom or violence toward women (Barron & Kimmel, 2000;

Bridges et al., 2010; Klaassen & Peter, 2015). Media literacy programs address the interpretation, realism, and desirability, and identification with media portrayals to help viewers become more critical of the content and therefore less vulnerable to its influence (Hobbs & Jensen, 2013). Although sexual media literacy programs have yet to show an impact on behavior, they have been shown to change key attitudes toward sexual behavior such as a greater efficacy to delay sexual activity and a lower likelihood to overestimate sexual activity among peers (Jeong & Hwang, 2012; Pinkleton, Austin, Cohen, Chen, & Fitzgerald, 2008). Thus, integrating sexual media literacy into existing sexuality education programming may be a promising step in maintaining the relevancy for today's adolescents.

Our results also reveal an important link between substance use and online sexual experiences. Our finding that participants who engaged in substance use were more likely to be members of the *Attractors* class than the *Online Abstinent* or *Seekers* classes is consistent with Objectification Theory (Fredrickson & Roberts, 1997) in that prior work has shown that self-objectification is positively correlated with alcohol, nicotine, and other substance use (Carr & Szymanski, 2010). Alcohol use was associated with a greater likelihood of membership in the Online Inclusive class compared to the *Attractors* class. This finding corroborates prior research which showed alcohol use to moderate the association between pornography use and sexting, such that the two are associated only for those who consume moderate to high amounts of alcohol compared to those who consume little to no alcohol (Morelli, Bianchi, Baiocco, Pezzuti, & Chirumbolo, 2016). It is important to note that prior research has also shown that 28% of adolescent social media profiles contain photographic reference to alcohol and other substance use (Hinduja & Patchin, 2008). Thus, investigating the role of social media in alcohol and substance use would enrich our understanding of adolescent development in the digital age.

Limitations and Future Directions

There are a few limitations that should be taken into consideration when interpreting these findings. First, all variables were obtained by self-report, so it is likely that some of the more sensitive experiences were underreported due to social desirability (Brener, Billy, & Grady, 2003). Second, participants were recruited with substantiated maltreatment through child protective services and it remains unknown how maltreatment experiences that do not meet the threshold of substantiation might impact online sexual experiences. Third, our sample was an all-female sample, and therefore results cannot be generalized to male adolescents. Although caution should be made when extending results to other populations of adolescents, this study includes a population of female adolescents with a diverse range of experiences, which is imperative to move the field forward and develop better sexuality education and internet safety programming. Finally, the design of this study is cross-sectional, therefore causality between online sexual experiences and offline behaviors cannot be determined.

Future research could improve upon the current study in a few ways. First, latent class research that examines how patterns of online sexual experiences predict future outcomes would be better able to assert causality. Second, future research could examine if there is a cyclical process in online and offline sexual experiences by modeling how latent classes and their correlates transition over time. Such knowledge would allow us to identify the etiology of online behaviors and offline risk to determine ideal time points for intervention. Third, among high school students, 49% indicated their use of technology to communicate with partners about sexual health, with rates of consistent condom use three times higher among adolescents who communicate about sexual health through technology as compared to adolescents who do not use technology to communicate about sex (Widman, Nesi, Choukas-Bradley, & Prinstein, 2014).

Therefore, future research should determine who is using technology in a positive way as a means of teaching those skills to adolescents who are already experienced in online sexual behaviors. Finally, the only sexual experience of male adolescents should be examined to determine links between their online experiences and offline sexual health and violence perpetration/victimization that may be unique for them.

Conclusion

To our knowledge, the current study was the first to apply a person-centered approach to online sexual behavior among female adolescents. LCA allowed the holistic examination of online sexual experiences, and identification for whom online sexual behavior patterns co-occur with offline sexual and substance use behaviors in ways traditional analytic approaches do not afford. Overall, our findings suggest that the majority of female adolescents have a low probability of having had online sexual experiences. For those who are having online sexual experiences however, engagement in offline sexual and substance use behaviors occurs in tandem suggesting that prevention programming should include education for online behaviors. Furthermore, maltreated female adolescents were more likely to have had online sexual experiences than non-maltreated female adolescents which indicates that future research should investigate the effect of online sexual experiences on the developmental processes of vulnerable populations.

Female adolescent sexual development is a multifaceted phenomenon where numerous factors can impinge on the normative developmental course. Over the past few decades, researchers have focused on the role that exposure to sexual media plays in female adolescent sexual development and, in particular, on sexual socialization (Aubrey, 2006; Dohnt & Tiggemann, 2006; Peter & Valkenburg, 2016; Noll et al., 2013; Ward, 2003). However, it has

been difficult for models of prevention to keep pace with the ever-evolving landscape of access to internet-based sexual media especially since the advent of high-speed internet. Regardless of the exact causal pathways, this study suggested that online sexual experiences may serve as markers for offline sexual and substance use behaviors. LCA can be a means of identifying individuals at greater risk for the purpose of adaptive or tailored interventions (Lanza & Rhoades, 2013). In accordance, information from this study could be used to identify individuals who could benefit from tailored messages during internet safety or sexuality education programming in order to capitalize on technology as the online context proves to be an important one for adolescent sexual development.

Table 1. Descriptive statistics and odds ratios for differences in online sexual experiences and offline covariates between maltreated and non-maltreated female adolescents

Variable	Label	Whole Sample Valid % N = 312	Maltreated Valid % N = 154	Non- Maltreated Valid % N = 158	Group Differences
					<u>Odds Ratios</u>
<i>Participant has visited a porn site</i>	frequency	37.7	46.7	28.0	2.19***
<i>Participant has engaged in cybersex or sexual role-play online</i>	frequency	34.8	49.1	23.6	2.10***
<i>Participant has chatted with others about sexual things online</i>	frequency	28.8	30.9	27.0	.64
<i>Participant has sent a nude photo/video of self over the internet/phone</i>	frequency	21.2	23.5	18.3	.55
<i>Participant has a sexy profile picture</i>	frequency	66.1	78.6	58.6	1.59**
<i>Someone has posted comments about how sexy the participant is</i>	frequency	44.4	44.3	41.4	.22
<i>Someone has requested nude photos</i>	frequency	35.8	38.5	32.3	.29
<i>Stranger has solicited participant online for sexual behavior</i>	frequency	36.9	41.9	30.5	1.08*
Ever had oral sex	frequency	53.0	56.2	49.3	.56
Ever pregnant	frequency	17.7	19.8	8.9	2.11***
					<u>t-tests</u>
Number of lifetime romantic partners ¹	<i>M</i>	4.6	5.8	4.2	2.40*
	<i>SD</i>	1.1	1.7	2.1	

Number of lifetime penetrative sex partners ²	<i>M</i>	2.3	3.8	1.7	3.36**
	<i>SD</i>	.4	.5	.8	
Age at first voluntary penetrative sex ³	<i>M</i>	14.1	13.2	15.3	2.32*
	<i>SD</i>	3.3	1.8	1.1	
Number of lifetime STIs ⁴	<i>M</i>	.51	.89	.49	3.75***
	<i>SD</i>	.76	1.33	.63	
Lifetime cigarette use occasions ⁵	<i>M</i>	2.8	.8	3.9	4.63***
	<i>SD</i>	1.1	1.0	1.8	
Lifetime alcohol use occasions ⁶	<i>M</i>	4.2	4.2	1.1	2.12**
	<i>SD</i>	1.8	5.3	1.9	
Lifetime marijuana use occasions ⁶	<i>M</i>	2.2	3.1	1.9	3.96***
	<i>SD</i>	1.2	1.0	1.5	

Note. * $p < .05$, ** $p < .01$, $p < .00$ ***; No missing data, all cases were observed on all variables. No missing data, all cases were observed on all variables. Class indicators are italicized. Each class indicator was scored as 1 = not endorsing the item and 2 = endorsing the item. Maltreated participants were coded as 1; non-maltreated as 0.

1. Number of romantic partners ranged from 0-8.
2. Number of penetrative sex partners ranged from 0-5 and included participants who were not sexually active.
3. Age at first voluntary penetrative sex means are based upon the scale described above, not chronological age.
4. Number of STIs ranges from 0-6.
5. Lifetime cigarette use occasions ranged from 0-4.
6. Lifetime alcohol and marijuana occasions ranged from 0-6.

Table 2. Fit statistics and model selection criteria for LCA models of adolescent online sexual experiences with 1-5 classes

No. of classes	L ²	AIC	BIC	CAIC	aBIC	LL	BLRT	Parameters
1	438.98	1688.50	1714.60	1722.60	1689.26	-836.25	--	8
2	185.76	1453.27	1508.74	1525.74	1454.89	-709.64	***	17
3	145.54	1431.06	1515.89	1541.89	1433.53	-689.53	***	26
4	115.97	1419.49	1533.68	1568.68	1422.81	-674.74	***	35
5	98.70	1420.22	1563.77	1607.77	1424.39	-666.11		44

Note. $p < .00$ ***; AIC = Akaike information criterion; BIC = Bayesian information criterion; CAIC = consistent Akaike information criterion; aBIC = adjusted Bayesian information criterion; BLRT = Bootstrap likelihood ratio test (X^2 diff); Entropy (R^2).

Table 3. Latent class prevalence rates and item response probabilities for 4 class model of online sexual experiences

Indicators	Overall sample proportion	<u>Latent class membership probabilities</u>			
		Class 1: Online Abstinent 52%	Class 2: Online Inclusive 19%	Class 3: Attractors 15%	Class 4: Seekers 13%
		<u>Item-Response Probabilities</u>			
Visit porn sites	37.7	0.05	0.55	0.00	0.50
Sex chat	28.8	0.05	0.56	0.00	0.68
Cybersex/role-play	34.8	0.03	0.95	0.00	0.05
Sexting	21.2	0.11	0.65	0.29	0.22
Sexy profile pic	66.1	0.00	0.50	0.74	0.00
Sex solicitation	36.9	0.04	0.76	0.58	0.27
Sexy comments	44.4	0.40	0.94	1.00	1.00
Sexy photos	35.8	0.08	0.99	0.55	0.41

Note. Each class indicator was scored as 1 = not endorsing the item and 2 = endorsing the item.

Table 4. Adolescent online sexual experience latent class prevalence as a function of maltreatment status

	Class 1: <u>Online Abstinent*</u>	Class 2: <u>Online Inclusive*</u>	Class 3: <u>Attractors</u>	Class 4: <u>Seekers</u>
<u>Maltreatment Status</u>				
Non-Maltreated	57%	14%	14%	15%
Maltreated	48%	23%	16%	12%

Note. * $p < .01$ differences in class membership

Table 5. Odds ratios for significant offline sexual and substance use behavior history variables predicting online sexual experience class membership

	Class 1: <i>Online Abstinent</i>	Class 2: <i>Online Inclusive</i>	Class 3: <i>Attractors</i>	Class 4: <i>Seekers</i>	Overall Wald Test
Intercept	1.4474	-1.6982	REF	1.2536	18.4587***
<u>Correlates</u>					
Sex partners ¹	-1.08*	0.79	REF	-.87*	10.22*
# of STIs ²	-1.60*	1.01*	REF	-0.71	10.39*
Ever pregnant	-1.18	0.02	REF	2.72**	9.02*
Cigarette use ³	-1.23*	1.52*	REF	-0.75	12.49**
Alcohol use ⁴	-0.84*	0.92*	REF	-0.82*	7.69*

Note. * $p < .05$, ** $p < .01$, *** $p < .001$; Outcomes are posterior probabilities of class membership. Non-significant correlates in the model included number of romantic partners, age at first voluntary intercourse, ever having oral sex, and marijuana use.

1. Number of penetrative sex partners ranged from 0-14 and included participants who were not sexually active.
2. Number of STIs ranges from 0-6.
3. Lifetime cigarette use occasions ranged from 0-4.
4. Lifetime alcohol and marijuana occasions ranged from 0-6.

Chapter 2 References

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Chapter 3:

A Person-Centered and Longitudinal Approach to Online Sexual Experiences and Offline Gender-Based Violence Victimization and HIV risk among Female Adolescents

Recent reports show that adolescents spend 11 hours a day online (Refuel Agency, 2015). However, implications of the online context for sexual development remain largely unknown due to the lack of longitudinal research in this area. Moreover, the lack of organized, widespread, and effective prevention programming that addresses online sexual experiences (e.g. internet pornography use, sex chatting) leaves parents as the chief source for educating adolescents about online sexual behavior (Ybarra, Finkelhor, Mitchell, & Wolak, 2009). Yet, even the most well-intentioned and well-informed parents have a difficult time monitoring or discussing online sexual experiences with their children (Byrne, Katz, Lee, Linz, & McIlrath, 2014; Tsai et al., 2014). To further complicate the issue, maltreated adolescents have even less parental protection and guidance in this area and many have emotional or cognitive deficits that may make them more vulnerable during online interactions with others (Knutson, DeGarmo, Koeppel, & Reid, 2005; Noll, 2005; Noll et al., 2013; Russell, 1986). Thus, more nuanced research that examines specific patterns of online sexual experiences, and the kinds of sexual health and victimization outcomes those patterns longitudinally predict, will elucidate *specific individuals* who would benefit from tailored intervention strategies. The current research aims to fill this gap in understanding of adolescent online sexual development by examining how different combinations of online sexual experiences predict later sexual health and victimization outcomes.

The impact of internet pornography use on sexual behavior during adolescence has become a growing topic of interest over the last two decades (Peter & Valkenburg, 2016).

Internet pornography is conceptualized here as “professionally produced or user-generated pictures or videos (clips) intended to sexually arouse the viewer” (Peter & Valkenburg, 2011, pp. 1015-1016). Prior work has found that pornography use among adolescents and emerging adults is associated with having had more sexual partners of all types, more frequent casual sex, and earlier onset of sexual activity (Peter & Valkenburg, 2016). Pornography use among female adolescents specifically, has been linked with several sexual risk behaviors such as a higher likelihood of engaging in sex at a younger age, testing positive for chlamydia, reporting wanting to conceive, and a lower likelihood of using contraception (Braun-Courville & Rojas, 2009; Wingood et al., 2001; Owens, Behun, Manning, & Reid, 2012). These findings suggest that pornography use is a consistent correlate to sexual behaviors, yet less is known about the causal directionality of the association due to the lack of longitudinal work in this area.

Adolescents can create their own sexualized images and share these widely through mobile and social media platforms. For example, ‘sexting’, or sending nude images via an internet-connected device (Crimmins & Seigfried-Spellar, 2014), has become a topic of concern. For instance, sexting has been linked with less condom use (Henderson & Morgan, 2011). Moreover, adolescents report sexting while intoxicated as a chief factor in facilitating casual hook-ups (Dir, Cyders, & Coskunpinar, 2013). Research has shown that engaging in the act of sexting among female adolescents has been linked to a higher likelihood of being sexually assaulted (Andar, 2014). Posing provocatively online and chatting with strangers about sex is associated with types of victimization such as stalking (Southworth, Finn, Dawson, Fraser, & Tucker, 2007), sexual solicitation (Mitchell et al., 2007a; 2007b; Noll et al., 2009), harassment, and commercial sexual exploitation (Mitchell, Jones, Finkelhor, & Wolak, 2010). However, less is known about how sexting co-occurs with other various types of online sexual experiences, or

how sexting affects future outcomes. Such knowledge is important for achieving a more realistic portrayal of online sexual experiences to inform prevention programming.

Although research in the area of adolescents' online sexual experiences is increasing, there remains a dearth of longitudinal and multi-dimensional work that can better capture causal directionality and individual differences in how online sexual experiences predict offline behaviors. For example, the body of longitudinal research that examines online sexual experiences is growing (for examples see Aubrey, 2006; Noll et al., 2013; Peter & Valkenburg, 2008; Peter & Valkenburg, 2011). However, prior variable-centered approaches fail to capture the complexity-and by extension-reality of behavior, where individuals have an array of experiences that are intertwined and not necessarily isolated (Magnusson, 2003). Thus, the current study takes a person-centered approach by using specific experiential patterns that are common among sub-groups of participants (Magnusson, 2003), called Latent Class Analysis (LCA), and uses those patterns to predict later sexual health and victimization outcomes. This approach provides nuanced information about the causal direction of online and offline sexual experiences as well as identifies those who are most vulnerable and may be in need of enhanced prevention or intervention. There are several theoretical perspectives that inform the current study and lead to the expectation that different patterns of online sexual experiences will predict the likelihood of different sexual health and victimization outcomes among female adolescents.

Gender-based Violence Victimization and HIV Risk among Female Adolescents

Female adolescents experience the overwhelming majority of adverse consequences from romantic and sexual experiences and thus may require focused investigation as unique pathways to negative sexual health outcomes may emerge for female adolescents, as opposed to male adolescents. Within abusive adolescent relationships, female adolescents are more likely to be the

recipients of the abuse than male adolescents (Black et al., 2011). Female adolescents who are in violent relationships are also more likely to experience reproductive coercion (i.e. where a male partner purposefully sabotages contraception in order to control a partner through pregnancy), and become unintentionally pregnant within those relationships (Miller et al., 2014). In terms of sexual violence, 1 in 5 women report being raped at some point in their lives compared to 1 in 71 men (Black, Sun, Rohrbach, & Sussman, 2011), with 11.8% of girls being raped in high school compared to 4.5% of boys (CDC, 2012). In terms of sexual health, the pathway to human immunodeficiency virus (HIV) for women is different from men, as women with HIV have long histories of sexual violence (Silverman, 2011; Wilson & Widom, 2008). Whereas, the majority of men with HIV are men who largely have consensual unprotected sex with other men (CDC, 2005). These disparities highlight the potential for unique pathways and experiences of Gender-based Violence (GV) and HIV risk for female adolescents specifically.

A central developmental task during the transition to adulthood is the attainment of healthy romantic relationships (Conger, Cui, Bryant, & Elder 2000). However, many adolescent romantic relationships are characterized as tumultuous (Halpern-Meekin, Manning, Giordano, & Longmore, 2013) and even physically violent (Haynie et al., 2013). It is well established that exposure to domestic violence in the home as well as experiencing childhood maltreatment is associated with later dating violence victimization and revictimization (Go´mez, 2011; Hamby, Finkelhor, & Turner, 2012). Consequently, physical Teen Dating Violence (TDV) victimization prevalence estimates among US adolescents range from 9% to 35% with female African American and Latina adolescents at highest risk (Davis, 2008). However, nearly one-half (47%) of adolescents report that TDV facilitated by mobile or online technology is a serious problem for their generation (Associated Press & MTV, 2011). Accordingly, 25% of female adolescents

report experiencing non-physical TDV facilitated by mobile or online technology, such as being threatened, harassed, or physically located through GPS by the perpetrator (Zweig, Dank, Yahner, & Lachman, 2013). Therefore, TDV is an important outcome to consider when examining online sexual experience patterns among female adolescents. Further, online sexual experiences have also been linked to sexual victimization (Andar, 2014).

National epidemiological data indicate that adolescence is a high-risk developmental period for another type of GV, namely sexual assault. For example, 35% of adult women who have been sexually assaulted were first assaulted between the ages of 12-17 (Black et al., 2011). Moreover, sexual assault survivors are more likely to have been maltreated during childhood (Messman-Moore & Brown, 2004; Messman-Moore & Long, 2003). In a nationally representative sample, peer-on-peer sexual assault was perpetrated against 51% of high school girls and was more likely to occur at school (Young, Grey, & Boyd, 2009). Effects of sexual assault include posttraumatic stress disorder, sexually transmitted infections, eating and sleep disorders, gastrointestinal disorders, chronic pain syndromes, unwanted pregnancy, harmful alcohol use, anxiety, and depression (Kilpatrick et al., 2003; WHO, 2013). Furthermore, national studies have shown that sexual assault victims are four times more likely to contemplate and 13 times more likely to attempt suicide than non-sexual crime victims (National Victim Center & Crime Victims Research and Treatment Center, 1992). Among college women, engaging in sexting is associated with having had experienced sexual assault, particularly after sending a sext to the eventual perpetrator (Andar, 2014). There is also an emergent trend of increased suicide attempts for sexual assault survivors who also experience some sort of digital harassment or abuse in conjunction with the offline assault (Burleigh, 2013), revealing the potentially lethal impact of digital sexual violence on youth. Therefore, understanding specific patterns of online

sexual experiences that predict later sexual assault experiences can bolster sexual assault prevention programs.

Adolescents ages 15-24 account for 39% of new cases of HIV each year (CDC, 2011), making adolescence an ideal point for intervention. Although the risk of HIV can be significantly reduced by consistent condom use (Sales et al., 2012), adolescents use condoms inconsistently (Friedman et al., 2001). The use of female condoms is even more rare (Weeks, Coman, Hilario, Li, & Abbott, 2013), and female adolescents have practical as well as psychological barriers to male condom use. For example, girls and young women are often shamed for carrying a condom in anticipation of sexual activity (de Vet et al, 2011). If a male partner does not initiate condom use, a female partner must negotiate that use or be able to safely and confidently refuse genital contact (Sales et al., 2012). These barriers make the use of male condoms a gendered issue, as female adolescents are often at the mercy of their male partners as the low-power positioned partner in heterosexual encounters (Tolman, Striepe, & Harmon, 2003). The use of drugs and alcohol before sexual activity is also considered to be an HIV risk behavior for adolescents (CDC, 2011) largely because being intoxicated during sexual activity is associated with a lesser likelihood of using a condom during sexual behavior (Patrick & Maggs, 2009). Further, having had a sexual partner during adolescence who originated from an online meeting is associated with more lifetime sexual partners, sex before the age of 14 as well as having used alcohol or other substances at last sexual experience (Buhi et al., 2013). For female adolescents in particular, there is a lower likelihood of condom use with a sexual partner who originated from an online sexual solicitation (Rice et al., 2015). Thus, more research is needed if we are to more fully understand the whether or not an online context impacts the etiology of HIV risk behaviors among female adolescents.

Theoretical Perspectives on Female Adolescent Sexual Development in an Online Context

Sexual scripting theory.

Sexual Scripting Theory (Simon & Gagnon, 1984) posits that individuals assume culturally-specific traditions and rules that comprise a ‘script’ to perform sexuality. Sexual scripts provide a cognitive schema of what constitutes normative sexual attitudes and behaviors. Sexual scripts are transmitted through a variety of sources such as parents, peers, and traditional media such as TV, film, and magazines. Today, sexual scripts are also transmitted through digital media such as internet pornography and social media outlets (Ward, Seabrook, Manago, & Reed, 2016). For female adolescents, the sexual scripts that are often transmitted emphasize sexual expression through physical means and sexual validation by others (Bay-Cheng, 2015; Shibley-Hyde & Durik, 2000; Tolman, 2002). One manifestation of these sexual scripts is the categorization of sexually active and non-active girls into ‘bad girls’ or ‘sluts’ and ‘good girls’ or ‘virgins’ (Bay-Cheng, 2015; Impett, Schooler, & Tolman, 2006; Tolman, 2002). For this script, ‘bad girls’ are sexual, good for sex, but undeserving of respect. Whereas ‘good girls’ are not sexual but deserving of respect. Consequently, sexual displays and behaviors can be paired with disrespect for girls but not boys. In addition, the ‘slut-virgin’ continuum compels self-blame among female adolescents for sexual experiences (wanted or not) and predicates self-worth on external evaluation of sexuality (Bay-Cheng, 2015). This slut-virgin sexual script can be transmitted by parents and school-based sexuality education where emphasis is placed on the importance for girls, but not necessarily boys, to remain virgins and be abstinent (Boone, 2015). In contrast, traditional and digital media often send the message that sexy girls have the most ‘fun’ (López-Guimerà, Levine, Sánchez-Carracedo, & Fauquet, 2010; Ward, 2003) and are liberated by proving “hotness” (Tolman, 2002). Consequently, these diametrically opposed

scripts create a confusing landscape for female adolescents, increasing the likelihood of ignoring their own needs and focusing on physical attractiveness and pleasing a partner. Thus digital media is contributing to this confusing landscape with portrayals of sexualized women being both rewarded through “likes” and “shares” as well as punished through harassment (Barak, 2005; Ringrose, Harvey, Gill, & Livingstone, 2013).

Objectification theory.

Traditional female sexual scripts place emphasis on girls and women to be sexually attractive and submissive (Impett, Schooler, & Tolman, 2006). According to Objectification Theory (Fredrickson & Roberts, 1997), girls and women are sexually objectified in our culture, or seen as objects that others act upon instead of subjects that take action. Consequently, girls and women take an observer’s perspective of their physical self as the primary view of their whole self. The ubiquitous images of sexualized girls in our culture may be beckoning female adolescents to self-objectify at puberty and beyond (Vandenbosch & Eggermont, 2012; Ward, Seabrook, Manago & Reed, 2016). Female adolescents can practice self-objectification (such as portraying extreme femininity and sexual submissiveness) by creating online profiles through social media platforms that inadvertently signal to the world that they are sexual and open to interaction (Manago, Graham, Greenfield, & Salimkhan, 2008; Thiel-Stern, 2009).

Consequently, provocative self-presentations are linked with higher offline sexual victimization rates, disordered eating, and lower cognitive ability (López-Guimerà, Levine, Sánchez-Carracedo, & Fauquet, 2010; Noll et al., 2009; Watson, Grotewiel, Farrell, Marshik, & Schneider, 2015; Vandenbosch & Eggermont, 2012). However, due to the lack of longitudinal investigations into this matter, it remains unclear whether self-objectification in an online context

predicts future offline behaviors or outcomes indicative of abhorrent sexual development or increased rates of sexual victimization.

The proteus effect.

The Proteus Effect (Yee & Bailenson, 2007) suggests that a person's behavior conforms to their digital self-representation (e.g. avatar). Online environments afford anonymity without in-person social feedback cues, allowing de-individuation to occur (McKenna & Bargh, 2000). In other words, adolescents can create digital self-representations that begin to seem real over time through frequent feedback in the form of 'likes' or comments, compared to offline identity which begets sporadic feedback. In accordance with The Proteus Effect (Yee & Bailenson, 2007), in an online world, if someone has a sexy avatar, that individual may be more likely to engage in behaviors that are consistent with that perception. For example, the individual may begin to flirt with strangers or engage in sexual chatting online and then extend those behaviors to offline contexts. The Proteus Effect was tested in a study where college students were given either shorter or taller avatars and placed in an immersive online environment (Yee, Bailenson, & Ducheneaut, 2009). In addition to participants with taller avatars acting more aggressively towards participants with shorter avatars online, participants with taller avatars also acted more aggressively while engaged in face-to-face interactions offline. Similarly, female adolescents who have been maltreated have been found to create more sexualized avatars in a lab setting compared to non-maltreated female adolescents (Noll, Shenk, Barnes, & Putnam, 2009). In turn, those with more sexualized avatars, were also more likely to experience online sexual solicitations which lead to offline meetings (Noll et al., 2009). Therefore, The Proteus Effect may emerge for female adolescents' online digital self-representations on social media and later offline behaviors.

Due to external pressure, female adolescents may present themselves in a sexually appealing way online, through posting or sharing provocative images on social media or through apps (Peluchette & Karl, 2009; Vandebosch & Eggermont, 2012). In turn, female adolescents may receive sexual attention for that presentation, and that praise may have the potential to eventually transform their offline behavior. Given the self-blame for sexual experiences and the pressure to gain sexual worth through physical expression (Bay-Cheng, 2015), female adolescents who present themselves in sexually provocative ways online may be less sexually assertive in offline sexual scenarios. Thus, if the Proteus Effect (Yee & Bailenson, 2007) is occurring for female adolescents' online and offline sexual behavior, then prevention programs should target online sexual experiences as a means of preventing offline outcomes that negatively affect female adolescents.

The Influence of Maltreatment

Both theory and research provide justifications for the expectation that adolescents who have been maltreated (e.g., experienced sexual abuse, physical abuse, or neglect) are both more likely to engage in higher rates of online sexual behaviors and experience more negative offline consequences (Finkelhor & Browne, 1985; Noll et al., 2009; Noll et al., 2013). Indeed, prior work has shown that maltreated adolescents engage in higher rates of sexual risk-taking online (provocative self-presentations and sexting) and offline (sex under the influence of alcohol or other substances, having sex without contraceptives, and prostitution), and experience higher rates of sexual victimization than their non-maltreated counterparts (Bensley, Eenwyk, & Simmons, 2000; Morokoff et al., 2009; Noll et al., 2003; Noll & Shenk, 2013; Noll, 2005; Noll, Shenk, Barnes, & Haralson, 2013; Norman, Byambaa, De, Butchart, & Scott, 2012; Wilson & Widom, 2011). In addition, a history of maltreatment is linked with a higher likelihood of

contracting HIV and other sexually transmitted infections (Wilson & Widom, 2008; 2011).

Female adults who were sexually and physically abused as children are almost three times more likely to be sexually and physically revictimized compared to non-abused females (Barnes et al., 2009). Although the pathways to HIV risk and GV likely differ for female adolescents, maltreatment remains a chief risk factor for both problems.

Maltreated adolescents endure experiences throughout childhood that elicit perceptions of powerlessness in relationships (Fiorillo, Papa, & Follette, 2013; Wilson & Widom, 2011), as children are unable to change or leave an abusive or neglectful caregiver. Consequently, dangerous romantic and sexual experiences ensue. Under the Traumagenics Dynamics Model (Finkelhor & Browne, 1985), sexually abused female adolescents may be more likely to internalize shameful female sexual scripts due to a self-perception of being “sexually used”. As a result of low self-worth, sexual abuse survivors may be less deterred by or even more attracted to dangerous romantic and sexual experiences (Russell, 1986). Adult revictimization among maltreated girls, particularly those who were repeatedly abused by a caregiver, is not only more frequent but is also more likely to be physically violent and perpetrated by older, non-romantic men compared to revictimization among females who were not abused by a caregiver (Barnes et al., 2009; West, Williams, & Siegel, 2000). Similarly, women who have been physically abused during childhood have a 5-fold increase in likelihood of HIV-risk behaviors, and women who have been sexually abused as children have a 7-fold increase (Bensley et al., 2000). Simply not having a strong parental presence to guide and monitor behavior could explain the link between neglect and early sexual debut and less contraception use (Norman et al., 2012; Wilson & Widom, 2011). It is important to note that it is rare for only one type of maltreatment to occur to the same individual, as most maltreated adolescents experience polyvictimization or the

experience of more than one type of maltreatment (Adams et al., 2016; Vachon, Krueger, Rogosch, & Cicchetti, 2015). Thus, it is difficult to truly disentangle which types of maltreatment are solely responsible for later revictimization and sexual risk taking. In sum, maltreated female adolescents could be more likely to experience GV and engage in HIV risk behaviors than non-maltreated female adolescents because of an attraction to situations that provide sexual validation while simultaneously confirming powerlessness (Finkelhor & Browne, 1985; Noll, Trickett, & Putnam, 2003). Thus, the unique orientation toward more dangerous romantic and sexual experiences for maltreated adolescents likely requires different prevention and intervention messages, which the current research can inform.

A Person-Centered Approach to Online Sexual Experiences & Offline Outcomes

Antecedents and consequences of online sexual experiences are typically studied using a variable-centered approach, such as regression analysis, in which each online sexual experience is examined separately (Bergman & Trost, 2006). These approaches require that the association between an online sexual experience and an offline sexual health or victimization outcome (e.g., sex without a condom, sex under the influences of substances) be quantified individually (Bergman & Trost, 2006; Magnusson, 2003). An advantage of variable-centered approaches is that they allow for an investigation of a specific online experience that confers significant offline risk (Bergman & Trost, 2006). However, a separate examination of each aspect of online sexual experience does not reflect the complex, real life experiences of adolescents or provide a comprehensive view of an individual's broader experiential picture (Magnusson, 2003). In contrast, a person-centered approach can (1) highlight an individual's entire spectrum of online sexual experiences, (2) determine what predicts particular patterns of online sexual experiences, and (3) examine the consequences of those online experiential patterns (Bergman & Trost, 2006;

von Eye & Bergman, 2003). A person-centered approach, Latent Class Analysis (LCA) with distal outcomes which uses identified classes based on loadings of variables to predict later outcomes (Lanza, Tan, & Bray, 2013; Vermunt, 2010), has been used to predict sexually transmitted infections as well as different interpersonal consequences with class membership of differing sexual behaviors (Vasilenko, Kugler, Butera, & Lanza, 2014; Wesche, Lefkowitz, Vasilenko, 2015). The current study will build upon this research by longitudinally predicting offline GV victimization and HIV risk using earlier latent classes of online sexual experiences.

In a prior study (Maas, Noll, & Bray, 2016), latent classes of online sexual experiences among female adolescents were uncovered. Four classes emerged (see Table 1), and included a low probability of having had any of the eight online sexual experiences (*Online Abstinent*), a high probability of having had all eight online sexual experiences (*Online Inclusive*), and split engagement in specific online sexual experiences (*Attractors* and *Seekers*). Maltreated female adolescents were more likely to be members of the *Online Inclusive* and less likely to be members of the *Online Abstinent* class than non-maltreated female adolescents. Several offline sexual and substance use behaviors were also correlated with class membership. In general, most offline risk correlates were associated with a higher likelihood of membership in the *Attractors* compared to other classes or the *Online Inclusive* class compared to the *Attractors* class, suggesting those two groups were most likely in need of intervention. However, having ever been pregnant was associated with a higher likelihood of membership in the *Seekers* class compared to the *Attractors* class, highlighting the need for differential prevention.

The Present Study

Due to the dearth of longitudinal research examining adolescent online sexual experiences, the present study uses four identified classes of online sexual experiences among

female adolescents (see Table 1) to determine how membership in those classes predicts offline Gender-based Violence (GV) and HIV risk one year later. Furthermore, due to the higher proclivity for offline GV victimization and HIV risk for maltreated youth, the current study determines how online class prediction of offline GV victimization and HIV risk differs by maltreatment status.

- Hypothesis 1: Consistent with Sexual Scripting Theory (Simon & Gagnon, 1984) and risky sexual behaviors portrayed in internet pornography (Barron & Kimmel, 2000; Bridges et al., 2010; Klaassen & Peter, 2015), female adolescents who are exposed to internet pornography may be less likely to insist that a male partner use a condom. Thus, it is hypothesized that (H1) membership in the *Online Inclusive* or the *Seekers* class will predict more HIV risk one year later compared to membership in the *Attractors* class.
- Hypothesis 2: According to Objectification Theory and the Proteus Effect (Yee & Bailenson, 2007), female adolescents who post sexy photos of themselves online and receive online attention from others will be more likely to seek out or receive similar attention offline at a later time point. Thus, it is hypothesized that (H2) membership in the *Attractors* class will predict a higher likelihood of Gender-based Violence one year later compared to membership in the *Online Abstinent* or *Seekers* classes.
- Hypothesis 3: Given that maltreated female adolescents have a greater proclivity to engage in risky online and offline sexual behaviors and are more likely to be victimized than their non-maltreated counterparts (Noll et al., 2003; Noll et al., 2013), it is hypothesized (H3) that membership in of any class except the *Online Abstinent* class will predict later HIV risk and GV victimization for maltreated female adolescents (Hypothesis 3).

Method

Participants

Female adolescents ($N = 296$) were recruited from a large, Midwestern city. Maltreated participants were recruited from local Child Protective Services (CPS) agencies and had experienced substantiated instances of physical abuse, neglect, or sexual abuse via state and local standards. Approximately half the sample ($n = 146$) was maltreated in order to make comparisons between maltreated and non-maltreated female adolescents. Consent to access CPS records for the entire sample was obtained to confirm substantiated maltreatment in both groups. Given over 50% of the sample experienced comorbid abuse and neglect types, analyses were not carried out by abuse type. Non-maltreated participants were recruited through a hospital-based adolescent health center and were matched with maltreated participants on race/ethnicity, family income, and family constellation (e.g., one vs. two-parent household). Validated abuse assessments (Barnes, Noll, Putnam, & Trickett, 2009) were conducted with participants and caregivers to determine that non-maltreated participants did not have any prior history of abuse or neglect. The total sample had a mean age of 14.83 years ($SD = 1.05$) at Time 1, had a median family income level of \$20,000–\$29,000, 51% came from single-parent households, and had a racial/ethnic make-up of 46% Caucasian, 44% African-American, 8% Bi- or Multi-racial, 1% Hispanic, and 0.5% Native American.

Procedures

This study was approved by the Institutional Review Board at a large Children's Hospital Medical Center. A Federal Certificate of Confidentiality was also secured. The design of the overall study was cross-sequential, where adolescents entered the study at 14-17 years old, and exited the study at 19 years old, thus there were 2 waves for those who entered in Wave 3 at age

17 and 5 waves for those who entered at age 14 at Wave 1. Caregivers provided consent for adolescents and reported on adolescent behavior for 2-5 waves of annual data collection.

Adolescents provided assent and completed sensitive questionnaires via computers to maximize security, paper and pencil questionnaires, a laboratory experiment, and semi-structured guided interviews for waves 2 through 5 of annual data collection. Families received approximately \$20 per hour as monetary compensation for their time, travel, and participation. Wave 2 had the largest number of participants with online sexual experience responses. Thus, the current study used Wave 2 online sexual experiences to predict Wave 3 HIV risk and GV to maximize power. For clarity purposes in this paper, Time 1 refers to the second wave of data collection and Time 2 refers to the third wave of data collection in the parent study.

Measures

Online sexual experiences at Time 1.

Online sexual experiences. Eight self-report items were derived to assess online sexual experiences (see Table 1), with possible responses ranging from 0 = “never” to 4 = “very often.” We were interested in deciphering differences in having had certain online sexual experiences or having not had certain online sexual experiences. All eight items had zero-inflated responses, thus we were able to dichotomize responses into 1 = “never” to 2 = “rarely-very often” in order to conduct a latent class analysis.

Offline outcomes at Time 2.

Teen Dating Violence. Having had experienced Teen Dating Violence (TDV) within the last 12 months was assessed using a series of questions about a boyfriend/romantic partner. Participants who answered “yes” to ever having had a boyfriend/partner and “yes” to currently having or

having a boyfriend/partner within the past year were asked for each boyfriend/partner reported on, “In the past year, has this boyfriend/partner ever been physically abusive to you (example: hit you, pushed you, or physically forced you into someone you did not agree to)?” Participants indicated the number of boyfriend/partners within the past year who have been physically abusive. Participants without partners or with non-abusive partners were coded as ‘0’. Participant scores ranged from 0-4.

Sexual Assault. Experiencing an unwanted sexual event (sexual assault or abuse) was assessed using the *Comprehensive Trauma Interview* (CTI: Noll et al., 2003) which was developed as a semi-structured interview to elicit factual information concerning traumatic events as well as subjective responses to those events and was given to participants annually to detect new or ongoing traumatic experiences. The first section of the CTI requests that participants describe the “worst” or “most upsetting” traumatic event they have experienced in their lifetime. Then inquiry is made into the specific traumatic experiences across several domains (e.g. physical assault, sexual assault, caregivers with substance use issues). The CTI also includes several detailed follow-up questions for each traumatic experience including (1) the age of the event or onset of re-occurring events; (2) frequency of occurrence; and (3) the relation and ages of perpetrators. Participant responses were coded with ‘0’ representing never being sexually abused or assaulted or never being sexually abused or assaulted within the last year and ‘1’ representing having had been sexually abused or assaulted by someone within the past year.

HIV Risk. HIV risk was assessed with 8 self-report items. Scores were coded as a number between 0 and 8 indicating the number of HIV risk behaviors a participant engaged in during the last 12 months. Behaviors included ever had intercourse without a condom, condoms failing during intercourse, intercourse or oral sex with an intravenous drug user, used intravenous drugs,

shared needles, intercourse or oral sex with a bisexual partner, unprotected intercourse with a homosexual male, multiple concurrent intercourse partners, one night stands, and intercourse while drunk or high. Participant scores ranged from 0-8.

Analysis Plan

We used established latent classes of online sexual experiences (Maas et al., 2016) to determine the prediction of HIV risk and GV victimization one year later with earlier class membership, as well as maltreatment differences in those predictions. The 3-Step regression analysis function (Vermunt, 2010) was utilized in Latent Gold 5.0 (Vermunt & Magidson, 2013). The first step consisted of running a LCA (Collins & Lanza, 2010). Second, posterior probabilities of class membership for each participant were saved in order to use class membership in each of the 4 classes as a unique predictor of outcomes. Third, two linear and one logistic regression model used latent class membership to predict the number of HIV risk behaviors, the number of TDV partners, and whether or not a participant experienced sexual assault in the past year. The Bolck, Croon, and Hagenars (2004) adjustment (BCH adjustment) was used with the 3-step approach to adjust for the number of classification errors. The *Attractors* class was chosen as the reference class in order to make the most comparisons between unique patterns of experiences. For example, we wanted to know which of the online sexual experience patterns predicted the most offline outcomes and using the *Attractors* class allows for comparisons to both the *Seekers* and *Online Inclusive*. Each model had all 4 class membership probabilities, maltreatment status and the interactions between each class membership and maltreatment status. In addition, each model included a control variable to account for the outcome at an earlier time point.

Results

In Table 2, we present the frequencies, means, standard deviations and maltreatment differences utilizing matched-pair t-tests or logistic regressions for HIV risk, TDV, and sexual assault. Maltreated participants were more likely to have engaged in HIV risk behaviors and to have experienced TDV than non-maltreated participants in the last 12 months as well. Maltreated and non-maltreated adolescents did not differ on having had experienced sexual assault in the last 12 months.

We used LCA with grouping variables in SAS and we fit freely estimated and constrained models in Latent Gold to examine measurement invariance in the latent class structure for maltreatment status. Comparing G^2 statistics in SAS ($\chi^2(36) = 47.51, p > .05$) and $2*\Delta LL$ in Latent Gold ($\chi^2(36) = 45.81, p > .10$) between the freely estimated and constrained models showed that the latent class structure did not differ by maltreatment status. Therefore, the same four classes were observed in both maltreated and non-maltreated participants. The 3-Step Covariate BCH method in Latent gold used a Wald test ($W = 19.19, p < .01$) to determine that distribution of class membership significantly differed by maltreatment status. Follow-up pairwise comparisons showed that participants in the *Online Inclusive* class were more likely to be maltreated than participants in the *Attractors* class ($\chi^2(1) = 10.31, p < .01$) or the *Seekers* class ($\chi^2(1) = 10.92, p < .01$). Participants were less likely to be maltreated in the *Online Abstinent* class than participants in the *Attractors* ($\chi^2(1) = 6.71, p < .05$) or the *Seekers* class ($\chi^2(1) = 7.33, p < .05$).

In the HIV risk model (see Table 3), a 2-step linear regression procedure was used to test hypothesis 1. We hypothesized that membership in the *Online Inclusive* or the *Seekers* class will predict more HIV risk one year later compared to membership in the *Attractors* class. However,

participants in the *Seekers* class were less likely to engage in HIV risk behaviors one year later than participants in the *Attractors* class. Participants in the *Online Inclusive* class were more likely to engage in HIV risk behaviors one year later than participants in the *Attractors* class. Thus, Hypothesis 1 was partially supported.

In the TDV model (see Table 3), a 2-step linear regression procedure was used to test hypothesis 2. We hypothesized that membership in the *Attractors* class will predict a higher likelihood of Gender-based Violence one year later compared to membership in the *Online Abstinent or Seekers* classes. However, participants in the *Seekers* class were more likely to have experienced TDV than participants in the *Attractors* class. In the sexual assault model (see Table 3), a 2 step logistic regression procedure was also used to test hypothesis 2. However, there was a trend of participants in the *Online Inclusive* and a significant effect for participants in the *Seekers* classes having been more likely to experience sexual assault one year later than participants in the *Attractors* class. Therefore, Hypothesis 2 was not supported.

We hypothesized that being maltreated and being a member of any class compared to being non-maltreated in any class would predict later HIV risk and GV (Hypothesis 3). In the HIV model, 2 times the change in LL for Step 2 was not significant, indicating that the addition of the interactions did not increase the amount of explained variance in HIV risk. Thus, we can conclude that maltreatment status does not moderate the prediction of HIV from class membership (see Figure 1). In the TDV model and sexual assault model, 2 times the change in LL for Step 2 was significant, indicating that the addition of the interactions did increase the amount of explained variance in TDV and sexual assault. From the interaction terms and follow-up analyses, we can conclude that maltreatment status does moderate the prediction of GV (see Figures 2 and 3) from class membership. As seen in Figure 2, participants in the *Seekers* class

had more violent romantic partners, particularly if they had been maltreated. As seen in Figure 3, participants in the *Online Inclusive* class were more likely to be sexually assaulted, particularly if they were maltreated. Further, participants in the *Online Abstinent* class were less likely to be sexually assaulted, particularly if they were not maltreated.

Discussion

We used data from a longitudinal study of female adolescents and determined whether patterns of online sexual experiences predict later Gender-based Violence (GV) victimization and HIV-risk behaviors one year later while controlling for prior GV and HIV risk. This study also demonstrates the utility of LCA for examining complex online sexual experiences that have differential prevention implications. Overall, online sexual experiences should be considered a dimension of sexual risk taking among female adolescents, but the combinations of these experiences may matter, especially for maltreated adolescents

HIV Risk

Building on the classes derived in Maas, Bray, and Noll (2016), the *Online Inclusive* class--engaging in all eight online sexual experiences-- was more likely to engage in HIV risk behaviors and experience sexual assault one year later as compared to the *Attractors* class. Maltreated adolescents were also most likely to engage in HIV risk behaviors and be members of the *Online Inclusive* class than non-maltreated participants. These findings are consistent with the Theory of Problem Behavior (Jessor, 1987), which posits that adolescents who engage in one problem behavior (i.e. non-condom use) will be more likely to engage in other problem behaviors (i.e. pornography use), particularly if they have a poor ecological context such as poverty and poor parenting experiences as maltreated adolescents often do (Noll et al., 2013).

In contrast, Sexual Scripting Theory (Simon & Gagnon, 1984) would suggest that members of the *Online Inclusive* class are engaging in more HIV risk behaviors because they are being sexual socialized online. For instance, there is a high probability of internet pornography use for the *Online Inclusive* class members. The most frequented pornographic websites depict sex in a gender-stereotypical way without attention paid to commitment or contraception (McKee, 2005). As a result, it is not surprising that among female adolescents who use pornography, nearly half report trying to copy behaviors seen in pornography and twice as many engage in anal sex compared to female adolescents who do not use pornography (Mattebo, Tydén, Häggström-Nordin, Nilsson, & Larsson, 2016). Thus, our results suggest the need to understand internet pornography as a primary source of sexual education for youth.

Gender-based Violence (GV)

In the TDV model, being a member of the *Seekers* class, especially for participants who were maltreated, predicted more violent romantic partners one year later. The *Seekers* had a high probability of having had used internet pornography, initiated a chat about sex online, had someone comment about how sexy they are on social media, and had someone request sexy/nude photos. It is possible that the types of online sexual experiences in which the *Seekers* engage in could occur within the context of a romantic relationship. For instance, the *Seekers* could be watching internet pornography with or receiving sexy photo requests from a boyfriend. Given that participants who were maltreated and members of the *Seekers* class were even more likely to have more violent partners, it is possible that maltreated *Seekers* have a history of volatile romantic relationships. Indeed, maltreated female adolescents are more likely to be revictimized in adolescence and adulthood than those who were not maltreated during their youth (Noll, 2005; Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003). Moreover, the *Seekers* were also more

likely to have ever been pregnant (Maas, Noll, & Bray, 2016). A large number of teen pregnancies occur within the context of a romantic relationship (Bunting & McCauley, 2004). Moreover, there is emerging research on reproductive coercion, or when a male partner purposefully sabotages contraception as a means to control the future abilities of the female partner (Miller & McCauley, 2013; Miller, McCauley, Tancredi, Decker, Anderson, & Silverman, 2014). Our findings suggest that more research in the area of TDV and teen pregnancy is warranted. Thus, comprehensive TDV prevention and revictimization prevention for maltreated youth should include education on how to spot warning signs for TDV, as well as pregnancy prevention.

In the sexual assault model, being a member of the *Online Inclusive* class, especially for maltreated participants, predicted a higher likelihood of sexual assault 1 year later. Moreover, being a member of the *Online Abstinent* class predicted a lower likelihood of sexual assault and there was a trend of membership in the *Seekers* class predicting a lower likelihood of sexual assault. This finding suggests that the combination of ‘attracting’ and ‘seeking’ are more predictive of sexual assault than either experiential pattern alone. Moreover, these results provide support for Objectification Theory (Fredrickson & Roberts, 1997), which posits that self-objectifying behaviors produce harmful outcomes through focused attention on external approval instead of personal well-being. The Proteus Effect (Yee & Bailenson, 2007) may also elucidate the means by which unique patterns of online sexual experiences predict later victimization. Indeed, if the *Attractors* and *Online Inclusive* are posting sexy photos of themselves and receiving requests from men for sex, this type of online ‘sexual performance’ may eventually transfer offline. Tolman (2002) and Bay-Cheng (2015) have extensive lines of research that show how female adolescents often ‘perform sexuality’ by displaying attractiveness and engaging in

sexual behaviors that are pleasing to men, without prioritizing their own wellbeing (e.g. sexual health, physical or psychological comfort). These behaviors are concerning because perpetrators tend to approach potential victims based upon their profile picture and other indicators of emotional vulnerability or sexual readiness (Whittle, Hamilton-Giachritsis, Beech, & Collings, 2013). Therefore, the internet may be a context where female adolescents are practicing harmful self-objectification, attracting attention from potentially dangerous men, and then carrying out self-objectification offline.

Implications for Prevention Programming

Due to the common and frequent exposure to internet pornography among adolescents (Owens et al., 2012; Ševčíková & Daneback, 2014), there is a clear and immediate need for sexuality education to include sexual media literacy that helps individuals learn to deconstruct themes in sexual media, and does not simply tell adolescents to avoid sexual media. Media literacy education, in general, has been shown to be effective in changing attitudes about substance use, improving body image, and reducing disordered eating symptoms (Kupersmidt, Scull, & Austin, 2010; Watson & Vaughn, 2006). The top 400 viewed videos on the most popular pornography sites, called ‘tube sites’ which feature professional and amateur pornography, the majority of scenes did not show condom use during sexual behavior and 6% showed nonconsensual sex due to intoxication (Klaassen & Peter, 2015). Consequently, female adolescents could be learning to accept sexual intercourse without condoms and sexual assault as normative, making them more prone to HIV and later victimization. Therefore, media literacy could ameliorate some of the gendered attitudes and norms that may develop from uncritical consumption of such material. Consequently, if the gendered norms that are seen in sexual media are targeted, there is also a potential for sexual health behavior change.

Due to the negotiations which must take place in order for a female adolescent to insist that her male partner use a condom (Sales et al., 2012), female adolescents must be comfortable discussing condom use with a partner (Baele, Dusseldorp, & Maes, 2001). Our findings suggest that female adolescents in the *Online Inclusive* class could be lacking in condom use negotiation skills, as they are more likely to engage in HIV risk behaviors than members of the *Attractors* class. Condom use negotiation education has been shown to increase condom use, even among childhood sexual abuse survivors (Morokoff et al., 2009). The HIV prevention program *SiHLE* has been shown to increase condom use among African American female adolescents (Wingood & DiClemente, 2008) by addressing sexual scripts which dictate that females must be submissive to males. Therefore, incorporating scripts gleaned from online sexual experiences, such as internet pornography use, may be a useful addition to sexual health and prevention programs, such as *SiHLE*, to keep the program relevant for today's digital native youth.

Limitations and Future Directions

There are several limitations to the current study that provide opportunity for future research. First, we do not have data from the romantic partners the participants reported on for our TDV variable. Therefore, we cannot determine any couple-level interactions that could be contributing to TDV. Second, we also do not know the sexual orientation of the participants because they reported on a boyfriend/partner. Future research should examine patterns of online sexual behaviors among sexual minority adolescents as they might predict different outcomes. Third, we did not collect data on types of cyber abuse, such as stalking or harassment. Current research has shown that the use of technology to perpetrate types of abuse in adolescent romantic relationships is becoming more common (Zweig et al., 2013). Thus, future research on TDV should include questions about cyber abuse as abuse behaviors may occur predominately in the

form of computer mediated communication and go undetected in more traditional measures of abuse. Fourth, the comprehensive trauma interview (CTI) that each participant received annually as part of the study was designed to elicit responses about severely traumatizing experiences that would otherwise go undetected in self-report questionnaires. In contrast, unwanted sexual experiences or even forced sexual experiences, may have not been captured in the trauma interview if the adolescent had not conceptualized the event as traumatic. Indeed, many women and girls often do not realize they have been sexually assaulted until years later because of stigma or confusion surrounding definition (Kelly, 2013). Therefore, there could be a range of sexual assault experiences that the CTI did not uncover. Fifth, given the female-only sample, we cannot generalize these results to male adolescents. Future research should investigate patterns of online sexual behaviors among male adolescents to determine if they predict certain types of perpetration of sexual violence.

Conclusion

Female adolescents develop within a cultural framework that expects them to prove their sexual worth by displaying themselves as attractive and available, yet punishes them for engaging in sexual behaviors, particularly out of the context of a committed relationship (Bay-Cheng, 2015; Impett et al., 2006; Vandenbosch & Eggermont, 2012). Concurrently, little support is provided to prepare female adolescents for refusing unwanted sexual experiences and safely carrying out (e.g. male condom use) wanted sexual experiences (Boone, 2015; Curtin et al., 2011; de Vet et al., 2011; Sales et al., 2012; Tolman, Striepe, & Harmon, 2003). With around-the-clock access to unlimited sexually explicit media that confirm these scripts and social media where these scripts can be practiced, female adolescents are developing within a new context, a

digital context that we know little about (Kaplan & Haenlein, 2010; Lenhart, O'Keeffe, & Clarke-Pearson, 2011).

The current study added to the literature in several ways by examining how various *combinations* of online sexual experiences among female adolescents longitudinally predicted sexual health and violence outcomes one year later. Findings suggest that the combinations of online sexual experiences matter for later HIV risk and GV victimization. Moreover, for maltreated female adolescents, engaging in more online sexual experiences predicted a significantly higher likelihood of TDV and sexual assault, suggesting that addressing online sexual behaviors for revictimization prevention is needed. The person-centered approach taken in this study has uncovered the multidimensional nature of online sexual experiences and their later outcomes. Indeed, using the LCA approach allowed us to find evidence for less typical patterns of online behaviors and their future outcomes. Uncovering the multidimensionality of online sexual experiences of adolescents is important insofar as many sexual behaviors during this period set a young person on a path that can have consequences that are lifelong. Thus, sexuality education and internet safety programming should not only incorporate online sexual experiences into current curriculum, but target specific individuals and their online sexual behavior patterns to reduce GV and HIV risk.

Table 1. Latent class prevalence and item response probabilities for 4 class model of online sexual experiences

	Overall sample proportions	<u>Latent class membership probabilities</u>			
		Class 1: Online Abstinent 52%	Class 2: Online Inclusive 19%	Class 3: Attractors 15%	Class 4: Seekers 13%
Indicators	Item-Response Probabilities				
Visit porn sites	37.7	0.05	0.59	0.00	0.46
Cybersex/role-play	39.8	0.03	0.95	0.00	0.05
Sex chat	28.2	0.05	0.56	0.00	0.68
Sexting	21.2	0.11	0.65	0.29	0.22
Sexy profile pic	66.1	0.00	0.55	0.74	0.00
Sexy comments	44.1	0.38	0.94	1.00	1.00
Sexy photos	35.7	0.08	0.99	0.56	0.41
Sex solicitation	32.8	0.04	0.76	0.58	0.25

Note. Indicators are dichotomous online sexual behaviors. Each class indicator was scored as 1 = not endorsing the item and 2 = endorsing the item.

Table 2. Descriptive statistics, *t*-tests and odds ratio for differences in HIV risk and Gender Based Violence victimization between maltreated and non-maltreated female adolescents.

Variable	Label	Whole Sample Valid % <i>N</i> = 296	Maltreated Valid % <i>N</i> = 146	Non-Maltreated Valid % <i>N</i> = 150	<i>t</i> /Odds Ratio
HIV risk ¹	<i>M</i>	3.14	3.61	2.99	3.01**
	<i>SD</i>	1.84	1.12	1.91	
	missing	6	4	2	
Teen Dating Violence ²	<i>M</i>	.37	1.15	.81	2.86*
	<i>SD</i>	.49	.29	.32	
	missing	9	4	5	
Sexual assault ³	No	86.7	90.2	84.4	.79 †
	Yes	13.3	9.8	15.6	
	missing	0	0	0	

Note. † $p < .10$, * $p < .05$, ** $p < .01$. Odds ratio for binary outcome in bold. Maltreated = 1; non-maltreated = 0.

1. HIV risk is a behavioral count variable with scores ranging from 0-8.
2. Teen Dating Violence is a count variable of number of physically abusive romantic partners in the last year 0-4.
3. Sexual assault was derived from the comprehensive trauma interview. A binary variable is coded such that 0 is no experience of sexual assault and 1 is any experience of sexual assault.

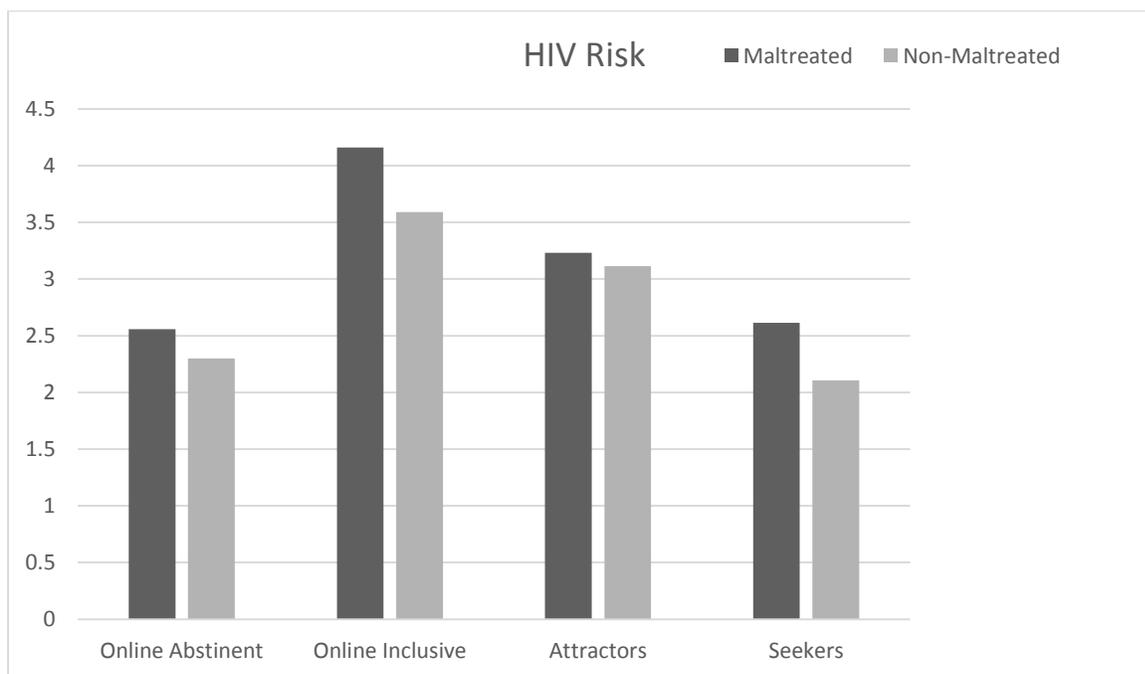
Table 3. Regression models showing HIV risk, Teen Dating Violence (TDV), and sexual assault predicted by earlier online sexual experience class membership.

	<u>HIV Risk</u>	<u>Teen Dating Violence (TDV)</u>	<u>Sexual Assault</u>
	β	β	<u>Odds Ratios</u>
Intercept	3.92***	0.706***	5.67***
Control	0.526***	-0.587**	0.22
Maltreatment	0.703*	0.261*	5.78**
Online Inclusive	0.456*	0.129†	3.21**
Online Abstinent	-1.285**	-0.202***	-5.23***
Sex Seekers	-0.112*	1.416**	-0.85
Step 2-2*ΔLL	NS	***	***
Intercept	2.120***	0.297***	5.05**
Control	0.505***	-0.401**	0.19
Maltreatment	0.714*	0.321*	4.38†
Online Inclusive	0.670*	0.019†	4.36***
Online Abstinent	-1.110*	-0.227***	-2.12*

Sex Seekers	-0.030	1.037**	-1.15 [†]
Attractors*Maltreatment	0.000	0.000	0.00
Online Inclusive*Maltreatment	0.787	-0.099	4.33***
Online Abstinent*Maltreatment	-1.015	-0.070	-5.46***
Seekers*Maltreatment	0.216	0.743*	2.15 [†]

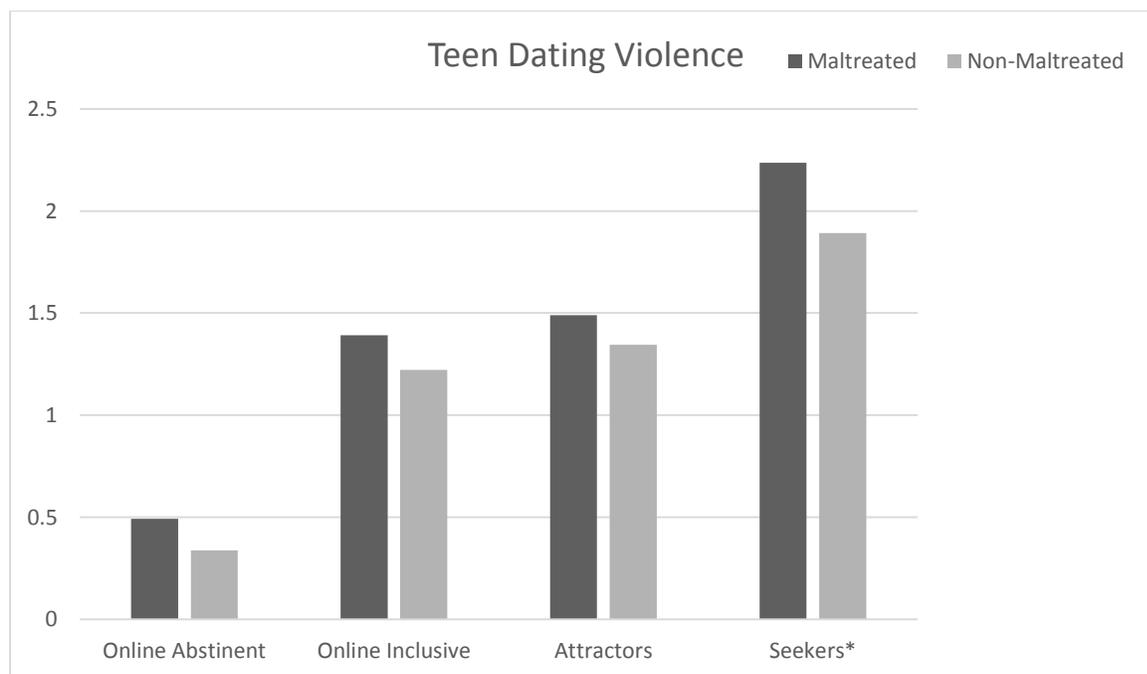
Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .00$. Control = Time 1 HIV Risk, Time 1 TDV, and Time 1 sexual assault. Maltreated = 1; non-maltreated = 2. The intercept is the reference class (*Attractors*).

Figure 1. *HIV risk by class membership and maltreatment status*



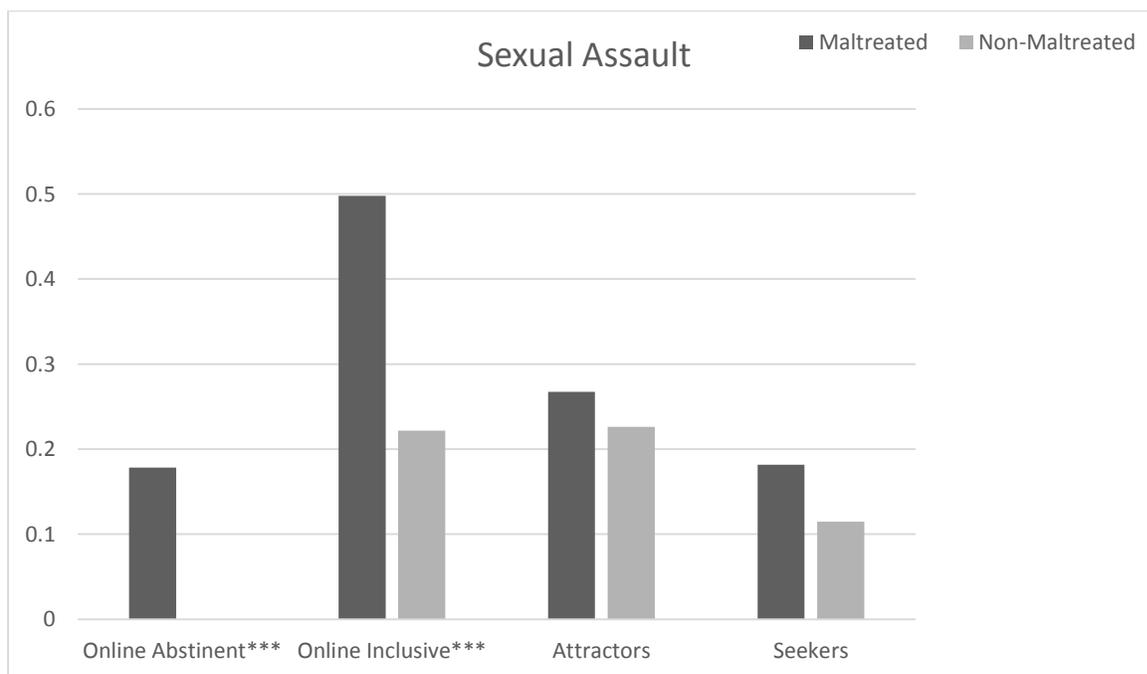
Note. Estimated values at 0 prior risk for HIV at Time 1.

Figure 2. *Teen Dating Violence by class membership and maltreatment status*



Note. * $p < .05$ maltreatment as a significant moderator of class membership and TDV; Estimated values at 0 prior risk for TDV at Time 1.

Figure 3. Probability of sexual assault by class membership and maltreatment status



Note. *** $p < .00$ maltreatment as a significant moderator of class membership and sexual assault; Estimated values at 0 prior risk for sexual assault at Time 1.

Chapter 3 References

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Chapter 4: Discussion

The process of development is complex, warranting methodologies that examine multiple factors and their interrelationships simultaneously in order to fully understand dynamic aspects of development (Bergman & Magnusson, 1997; Nurius & Macy, 2008; von Eye & Bergman, 2003). To date, there is a burgeoning body of work (for examples, see: Noll, Shenk, Barnes, & Haralson, 2013; Noll, Shenk, Barnes, & Putnam, 2009; Peter & Valkenburg, 2016) which has examined how various online sexual experiences are linked to antecedents and consequences as singular variables (e.g. internet pornography use or sexting), despite the reality that individuals are unlikely to have only one type of online sexual experience. Similar to the offline context, online sexual experiences are multidimensional and make up different experiential patterns. This dissertation contributed to the body of knowledge on adolescent sexual development by examining individual differences in simultaneous online sexual experiences as well as offline behavioral predictors of these online sexual experiences and later offline outcomes of these online sexual experiences.

Four latent classes of online sexual experiences among female adolescents were uncovered. The four classes that emerged included a low probability of having had any of the eight online sexual experiences (*Online Abstinent*), a high probability of having had all eight online sexual experiences (*Online Inclusive*), and split engagement in specific online sexual experiences (*Attractors* and *Seekers*). Maltreated female adolescents were more likely to be members of the *Online Inclusive* and less likely to be members of the *Online Abstinent* class than non-maltreated female adolescents were. The *Online Inclusive* class and the *Attractors* class were more likely to engage in later HIV risk or be sexual assaulted one year later. In general, most offline risk correlates were associated with a higher likelihood of membership in the

Attractors compared to other classes or the *Online Inclusive* class compared to the *Attractors* class, suggesting those two classes are most likely in need of intervention. However, having ever been pregnant was associated with a higher likelihood of membership in the *Seekers* class compared to the *Attractors* class and the *Seekers* were also more likely to experience Teen Dating Violence 1 year later, highlighting the need for differential prevention.

Although the *Online Inclusive* class was not hypothesized, it is not surprising that many offline risk behaviors predicted a higher likelihood of membership in that class, or that membership in the *Online Inclusive* class predicted a higher likelihood of HIV risk behaviors and sexual assault. Prior research has found that adolescents who have reported alcohol, nicotine, or other drug use, also scored higher on measures of internet and cybersex addiction and that prior antisocial deviance predicted both substance use and internet and cybersex addiction, suggesting similar etiological pathways to both maladaptive outcomes (Castro-Calvo et al., 2016). Therefore, engaging in more online risk and offline risk is consistent with the Theory of Problem Behavior (Jessor, 1987), which posits that adolescents who engage in one problem behavior (i.e. substance use) will be more likely to engage in other problem behaviors (i.e. pornography use). Thus, the *Online Inclusive* class may be more at risk for a host of both online and offline behaviors more generally.

Maltreated adolescents were more likely to be members of the *Online Inclusive* class than non-maltreated adolescents were. This finding is consistent with prior research showing that maltreated adolescents are more likely to engage in a variety of online sexual behaviors than their non-maltreated peers (Mitchell, Finkelhor, & Wolak, 2007b; Noll et al., 2013). It is possible that maltreated members of the *Online Inclusive* class are engaging in a variety of online sexual experiences because they are psychologically dysregulated from abuse or neglect. In general,

psychological dysregulation is the inability to optimally and willfully control and guide one's cognitions, behaviors, and emotional responses in a goal-directed manner (Clark, Thatcher, & Tapert, 2008). Maltreated youth tend to be psychologically dysregulated, and in turn, that dysregulation predicts riskier sexual behaviors both online and offline (Noll, Haralson, Butler, & Shenk, 2011; Noll et al., 2013). Prior research shows that adolescents who score high in sensation seeking, another facet of dysregulation, are more likely to use internet pornography than those low in sensation-seeking (Peter & Valkenburg, 2011). Thus, maltreated female adolescents could be using online sexual experiences as a manifestation of dysregulation.

There may be an alternative explanation for a higher likelihood of class membership in the *Online Inclusive* class for sexually abused participants specifically. According to the Traumatogenesis Dynamics Model (Finkelhor & Browne, 1985), sexual abuse survivors experience intense shame and guilt around sexuality, which can manifest in several different ways of orienting toward sexual activity. Indeed, childhood sexual abuse survivors have been found to have distorted cognitions surrounding sexuality (Noll, Trickett, & Putnam, 2003). For example, they may be ambivalent about sex and sexual activity such that they experience both arousal and aversion simultaneously in a sexual context. Therefore, it is possible that the participants who were sexually abused are attempting to recreate sexual arousal that is paired with sexual exploitation or shame with internet pornography use, sexting, or cybersex play. Prior research has shown that exposure to internet pornography increased sexual pre-occupancy (i.e. heightened orientation toward sexual thoughts, feelings, or behaviors) over the course of a year in a sample of emerging adults, if they were subjectively aroused by it (Peter & Valkenburg, 2008). Given that sexually abused female adolescents have a greater proclivity toward sexual preoccupation than non-abused female adolescents (Noll, Trickett, & Putnam, 2003), engaging in online sexual

experiences, such as internet pornography use, may be fueling their pre-occupation. Thus, it would be important for future research to determine if sexual distortions play a role in adolescents' online sexual experiences, so those distortions can be addressed in current trauma treatments and trauma-informed prevention.

In study 1, having ever been pregnant predicted a higher likelihood of membership in the *Seekers* class. In study 2, the *Seekers* were more likely to experience Teen Dating Violence (TDV). Thus, it is possible that online sexual experiences are occurring in a romantic relationship context for the *Seekers*. If online sexual experiences are occurring for the *Seekers* within the context of a romantic relationship, they would benefit from additional education focusing on contraceptive use in romantic relationships to prevent pregnancy, as opposed to education to increase condom use likelihood. Prior research has shown that young women feel pressure to engage in online sexual behaviors from their romantic partners (Peter & Valkenburg, 2016; Ringrose, Harvey, Gill, & Livingstone, 2013). Consequently, the *Seekers* could benefit from education programs that teach skills for refusing to emulate what they see in pornography or send nude photos to a boyfriend if they do not want to.

Expanding refusal skills to online experiences should also be incorporated into existing relationship education programs such as *Relationship Smarts PLUS* (Pearson, 2007), which teaches adolescents skills to navigate romantic relationships. A current relationship education program, *Safe Dates*, could be improved upon by addressing online sexual experiences as well as maltreatment. *Safe Dates* has been shown to be effective at preventing physical and sexual violence perpetration and victimization, even four years later, particularly for adolescents who had experienced prior physical victimization (Foshee et al., 2004). *Safe Dates* consists of 10 sessions with interactive activities and role-playing to help participants distinguish loving,

caring, and safe sexual and romantic scenarios from controlling, abusive, or coercive scenarios. As of yet, it is not clear how effective *Safe Dates* is for preventing online abuse or revictimization among maltreated adolescents. Therefore, *Safe Dates* is an example of a program, which these studies can inform the tailoring of content to meet the needs of those most vulnerable.

The *Attractors* did not endorse going to internet pornography sites or initiating chats about sex online, but they did attract attention from others, suggesting a need for a different type of prevention for *Attractors* compared to *Seekers*. The *Attractors* may benefit from education around sexual self-presentation and skills to ward off unwanted online and offline sexual solicitation. For example, the sexual health promotion program, “It’s Your Game” has been shown to be effective for increasing condom knowledge and condom use self-efficacy by teaching adolescent participants to: (1) *select* their personal rules (or limits) regarding their behaviors (sexual and non-sexual) ahead of time; (2) *detect* signs and situations that could challenge their rules; and (3) *protect* their rules with refusal skills (use a clear no or alternative actions)’ (Peskin et al., 2015). Our findings can inform this line of work by underscoring the need to develop *online* sexual refusal skills to promote sexually efficacious female adolescents.

Implications and New Directions for Sexuality Education that Serves Female Adolescents

Addressing trauma.

To discern the unique contribution of maltreatment, maltreatment was used as a moderator of the prediction of later sexual health and violence outcomes from earlier online sexual experience class membership. Contrary to what was expected, maltreatment status moderated the prediction of only TDV and sexual assault with class membership, but not HIV

risk behavior. This result suggests that for maltreated female adolescents, online sexual experiences matter more for the prediction of GV victimization than for non-maltreated female adolescents. Female adolescents who are vulnerable due to maltreatment deserve specified focus in both research and prevention, as they are substantially more likely to engage in online sexual experiences, HIV risk behaviors, as well as experience GV victimization than non-maltreated female adolescents are. Consequently, there is not sufficient evidence that current sexuality education programs are effective for maltreated female adolescents, who are also younger at first voluntary intercourse, 5 times more likely to be teen mothers, more likely to be sexually assaulted, more likely to have an STD, and have lower contraceptive efficacy than non-maltreated adolescents (Parillo et al., 2001; Rothman et al., 2007; Noll et al., 2003; Noll et al., 2003; Noll & Shenk, 2013). Thus, prevention strategies need to address potential mechanisms, such as certain online sexual experience patterns that may be contributing to maladaptive outcomes.

Although not tested in the current study, psychological dysregulation is a possible mechanism for maltreated adolescents engaging in more HIV risk behaviors and experiencing more revictimization. Indeed, maltreated youth tend to be psychologically dysregulated, and in turn, that dysregulation predicts riskier sexual behaviors both online and offline (Noll et al., 2011; Noll et al., 2013). Maltreated youth are also more likely to experience anxiety and depression (Knutson et al., 2005; Vachon et al., 2015), as well as suffer from PTSD which can include dissociation, stress sensitivity, and substance use (Vranceanu, Hobfoll, & Johnson, 2007). Therefore, it is likely that current sexual health programs fail to address the needs of female adolescents who have been maltreated, largely because they do not sufficiently address trauma. Trauma-informed prevention would address PTSD as an additional barrier to sexual

health and risk factor for sexual violence through screenings and referrals to trauma treatment. For example, maltreated individuals who avoid feeling intense emotions as they arise (experiential avoidance), are more likely to experience PTSD than those in treatment to work through emotions (Shenk, Putnam, Rausch, Peugh, & Noll, 2014). Treating experiential avoidance is important insofar as those who are high in experiential avoidance are less likely to detect threat because they are consistently 'checked out,' making revictimization more likely to occur (Fiorillo et al., 2013). Thus, including screening for PTSD in conjunction with sexual health and violence education proves to be a promising step in preventing re-victimization among maltreated adolescents.

Successful approaches for treating women who have been revictimized include helping the victim learn how to label and identify emotions, tolerate and manage those emotions, and negotiate difficult interpersonal situations (Cloitre, 1996). One such approach, trauma-focused cognitive behavioral therapy (CBT), which facilitates working through intense emotions, has been shown to be an effective treatment for the prevention of revictimization (Iverson et al., 2011). Although not measured in these studies, it is possible that maltreated adolescents are using online sexual experiences as a means of experiential avoidance, and thus are more likely to be revictimized. Indeed, prior work has shown that adolescents who score high on internet sexual addiction scales, report feeling relief or even numb while using the internet for sexual purposes (Owens et al., 2012). Therefore, female adolescents may be using online sexual experiences to avoid feelings, and over time, be more likely to be victimized because they cannot detect potential threat. Thus, effective prevention programming and trauma treatments for maltreated youth should address trauma by targeting experiential avoidance and assess for online sexual experiences as a potential facilitator of experiential avoidance.

Women who have been sexually victimized take longer to recognize threat in dating scenarios and have trouble processing sexual trauma-related stimuli in experimental settings (Field et al., 2001; Wilson, Calhoun, and Bernat, 1999). Unfortunately, it is rare for sexual assault prevention programs to target the recognition of threat. Consequently, sexual assault prevention programs that target a general audience seem to be effective in changing attitudes but are less effective in reducing revictimization among sexually abused women (Classen, Palesh, & Aggarwal, 2005). Programs that are most promising for preventing revictimization appear to have longer and more involved interventions, but remain effective for those who were only moderately (as opposed to severely) victimized (Gidycz et al. 2001a; Gidycz et al., 2001b). Prevention strategies are likely not as effective at reducing revictimization among maltreated female adolescents because these strategies rely too heavily on emphasizing the risk inherent with behaviors, instead of developing the cognitive and affective skills to address potentially dangerous scenarios.

Building the sexual self.

The World Health Organization (WHO, 2006) defines sexual health as a state of physical, emotional, mental, and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction, or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, and violence (WHO, 2006). Emerging from this definition of sexual health is the study of the sexual self, or sense of one's self as a sexual person (O'Sullivan, Meyer-Bahlburg, & Mckeague, 2006). The development of the sexual self is important because the transition to adulthood requires sexual and romantic competencies, as the attainment of successful sexual and romantic relationships is a common marker of adulthood

(Conger et al., 2000). Researchers have investigated aspects of the sexual self, such as *sexual self-efficacy*, an individual's perceived ability to successfully engage in and initiate a variety of sexual activities (Rosenthal, Moore, & Flynn, 1991) and *sexual esteem*, the tendency to view oneself as capable of relating sexually to another person (Snell & Papini, 1989) and an overall positive view of one's sexual self. It is possible that the reason why different patterns of online sexual experiences predict different outcomes is because some patterns have a negative effect for the development of the sexual self; whereas other patterns have a positive effect. For instance, one study of online sexual behavior found no difference in a variety of outcomes for adolescents who did or did not engage in online sexual behavior (O'Sullivan, 2014). Thus, a person-centered approach to research on the role of online sexual behavior in the development of the sexual self is warranted in order to promote the WHO's conceptualization of sexual health.

Building on the concept of the sexual self, some successful prevention programs (e.g. *SHiLE*) that reduce HIV risk behavior among female adolescents target the *self-efficacy* to enact health behaviors, even in circumstances of intense pressure. A prime example of this is female-initiated, male condom use during sexual behavior, as girls and women need self-efficacy to request that a partner use a condom (Sales et al., 2012). Female adolescents who are high in sexual self-efficacy and sexual esteem are more likely to use contraception (Maas & Lefkowitz, 2015). In addition to the promotion of condom use, sexual self-efficacy and esteem have also been found to prevent unwanted sexual experiences, as the majority of sexual assaults are perpetrated by men whom the victim knows well (Fisher et al., 2003), requiring her to have the efficacy to avoid or remove herself from a potentially unwanted sexual scenario. For example, one study has shown that sexual esteem can mediate the association between sexual abuse and sexual revictimization (Van Bruggen, Runtz, & Kadlec, 2006). Thus, prevention programs that

target the role of online sexual experiences in the development of the sexual self could potentially be effective for preventing HIV, TDV, and sexual assault among maltreated female adolescents as well as female adolescents in general.

Tailoring prevention messages.

Our current school-based sexuality programming falls short of addressing the needs of female adolescents by emphasizing broad and vague prevention messages such as abstinence-only (Bay-Cheng, 2003). The abstinence-only model assumes that all adolescents have refrained from sexual behavior at the time of implementation. Perhaps “failing” (under an abstinence-only model) to resist sexual intercourse takes a toll on adolescents’ confidence in their ability to resist unwanted or unprotected sexual interactions in the future (Rostosky, Dekhtyar, Cupp, & Anderman, 2008). Moreover, the messages of abstinence until marriage likely increase shame and potentially exacerbate trauma symptoms among sexual abuse survivors who might already see themselves as “damaged goods” (Finkelhor & Browne, 1985; Russell, 1986), decreasing their likelihood of using contraceptives or choosing appropriate partners. Thus, the abstinence-only prevention message may make female adolescents who are already sexually active feel ashamed of their sexual selves, which could limit future efficaciousness.

Person-centered approaches to research and prevention highlight the need to tailor prevention messages, as prevention messages may not have the same impact on different types of adolescents. For example, the importance of using condoms may be less relevant to a female adolescent who would only engage in sex with a trusted romantic partner, which she may perceive as less risky. Thus, discussing the effectiveness of hormonal birth control or longer-term birth control may be more effective in preventing pregnancy. Regarding online sexual experiences, messages warning adolescents about the negative consequences that could occur

from sexting may not be effective for adolescents who have already sent sexts or have friends who send sexts and have yet to experience a negative consequence. In general, the meaning and individual experience of sexual behavior in adolescence are not homogenous (Hensel & Fortenberry, 2013), as there are many personal-level factors (e.g. emotions and cognitions) and social-level factors (e.g. family and religion) that contribute to an adolescent's experience of sexual behavior. Thus, programs should carefully consider and examine how prevention messages may differentially impact female adolescents' sexual decision making, and a person-centered approach to prevention can facilitate that consideration.

Conclusion

Recent reports of adolescent internet use show that adolescents spend an average of 11 hours per day using internet-connected devices (Refuel Agency, 2015). This level of usage, along with the proliferation of the internet across all socio-economic strata, provide new avenues for adolescents to explore both social and sexual contexts in ways not previously accessible to past generations. The majority of research has focused on prevalence rates, correlates, and outcomes of various online sexual experiences such as pornography use, sexting, and social media use among adolescents in general (Mitchell, Finkelhor, Jones, & Wolak, 2010; Peter & Valkenburg, 2016). Prior work on adolescent sexuality has also begun to emphasize the need to address the unique aspects of female sexual development (Impett, Schooler, & Tolman, 2006; Tolman, Striepe, & Harmon, 2003). Thus, a more intensive investigation into the internet and social media habits of female adolescents was needed. These studies built upon prior work by using a person-centered approach, Latent Class Analysis (LCA), to examine online sexual experiences among female adolescents specifically. This approach allowed for the uncovering of unique online sexual experience patterns (or classes) that encompass a broad range of behaviors,

instead of examining each behavior separately in a variable-centered approach. Knowledge gleaned from these studies will be instrumental in tailoring sexuality education and internet safety programming to address the specific needs of female adolescents.

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PUBLICATIONS

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