TELEPRESENCE AND SEXUALITY: A REVIEW AND A CALL TO SCHOLARS

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Abstract*: Scholars have examined the phenomenon of telepresence, a perceptual illusion of nonmediation experienced by media users, in a wide variety of contexts. This paper explores telepresence theory and research in the rarely examined but important context of sexually arousing media content. After defining key concepts, the paper presents reasons scholars should study telepresence in the context of sexuality, reviews the evolution of relevant media technologies and the nature of relevant telepresence responses, and considers potential theoretical contributions and avenues for future research in interpersonal communication, media studies, and presence scholarship.*

Keywords: *telepresence, sexuality, human-technology, media, parasocial, social richness, realism, immersion.*

INTRODUCTION

Telepresence, hereafter shortened to presence, is an interdisciplinary topic of increasing interest to both scholars and the business community. Most often defined as the sense of "being there" with real or fictional people and objects via communication technology, scholars have explored the role of presence and presence technologies in a wide range of settings and contexts, including business (Lombard & Snyder-Duch, 2001; Mollen & Wilson, 2010; Suh & Chang, 2006), entertainment (Bracken & Skalski, 2009), health and medicine (Latifi et al., 2007; Riva, 2004), space and undersea exploration (Ballard, 2008; Terrile & Noraky, 2012), art (Barbatsis, 1999; Saltz, 2001), and many others (see Lombard & M. T. Jones, 2007). But researchers and theorists have not explored presence in the context of sexuality, even though sex is a primary biological need, sexual media products generate billions of dollars globally each year, and exploring this context holds promise for expanding our understanding of a variety of presence-related interpersonal and mediated communication processes and effects.

In this paper, we explore the topic of presence and sexuality. First, we define relevant key terms and outline reasons scholars should examine presence concepts and theories in the context of sexuality. We then review the evolution of technologies in this area and consider the nature of

presence responses in the context of sexuality. We close the paper with potential theoretical insights and avenues for future research suggested by presence developments in this area.

DEFINING KEY TERMS

To sufficiently examine presence and sexuality, it is first necessary to define the terms presence, sexuality, and sexual media content. Presence is defined here, following Lombard and Ditton (1997), as "the perceptual illusion of nonmediation" ("Presence Explicated," para. 1). This refers to a phenomenon in which an individual perceives a mediated experience as an authentic first-hand experience to which they may respond as physiologically, cognitively, and emotionally as they would in the nonmediated setting. Although there are many definitions of presence (for a review, see Lombard & M. T. Jones, in press), this often-cited definition, similar to that in the detailed explication of the International Society for Presence Research (2000), can be productively applied to a wide variety of relevant phenomena. This inclusiveness can be seen in the key dimensions or types of presence discussed in the Characteristics section below.

Sexuality refers to physiological and psychological phenomena related to the arousal of human reproductive organs (see Heiman & Pfaff, 2011). Sexual media content includes pornography and erotica, both of which are notoriously difficult to define (e.g., Supreme Court Justice Potter Stewart's famous "I know it when I see it" quote from *Miller v. California*, 1973; for reviews, see Andrews, 2012; Linz & Malamuth, 1993; Mosher, 1988). Sexual media content describes any content presented or experienced via technology and which is designed in part to elicit or enhance the sexual arousal of users. This includes pornography (defined here as mediated sexually explicit materials in a commercial product), erotica (typically less explicit, with artistic or educational aspirations), and, although not the primary focus here, nonexplicit sexually arousing content, for example, swimsuit issues of sports magazines, Victoria's Secret television specials, and beer commercials featuring attractive, scantily clad models and celebrities. In any of these contexts, the content may be fictional, nonfictional, or a combination of the two, and may or may not follow a narrative. With technology defined broadly as the systematic application of human industrial arts, the media forms that carry the sexual media content can logically include not only print and digital media, but also adult products such as vibrators, dildos, and sex dolls. All designed and manufactured physical products mediate human sexual experiences. Sexual media content and form are created for and used by people with different sexual orientations and preferences and for use independently and/or with others.

REASONS TO EXAMINE PRESENCE AND SEXUALITY

Clearly, sexuality deserves scholarly attention. Along with air, food, water, sleep, and warmth, sex is classified as a biological or physiological human need at the base level in Maslow's hierarchy of needs (Maslow, 1954/1987, 1968/1998; see also Alderfer, 1969; Heiman & Pfaff, 2011). Beyond the biological imperative to reproduce, humans need and highly value emotional intimacy and connection with sexual partners, aspects of the belongingness and love needs in Maslow's hierarchy. Whether based in evolution or culture, it is clear that sex and

intimacy are critically important to most human beings. How and with what success they seek fulfillment of these needs via sexual media content and technology, then, should be of great interest to scholars of sexuality as well as technology, media, and many other fields including, of course, presence. Such research interest is imperative particularly because, although it encompasses much more (see Noonan, 2011), the essence of sex has been characterized as "the ultimate in embodiment—a corporeal experience in which physical bodies interact" (Waskul, Douglass, & Edgley, 2000, p. 375) and the essence of (at least many conceptualizations of) presence is physical interaction with/in a mediated environment.

Although creators and distributors of sexual media content do not use the term explicitly, they clearly seek to produce an experience of presence, a sense of being physically, and in some cases emotionally, close to the people represented in their media products. Their efforts have been closely tied to the evolution of media technology and, in many cases, have driven the development, innovative use, and profitability of such technology, from the printing press to photographic processes to interactive, real-time, remote sex toys (see the Evolution of Media Technology section below). We, as researchers and humans, need to better understand how the long pursuit of presence in this context has guided, and especially how it is likely to guide, the evolution of all media technologies, as well as the consequences of this evolution.

Like only a few of the many contexts in which presence concepts have been studied, a large, diverse, and global public already is regularly consuming mediated sexual content and experiencing presence. Estimates of the size of the adult entertainment industry vary widely from US\$1–14 billion annually in the United States (Leung, 2007; McAlpine, 2002; Rich, 2001; see also Belle, 2010) to up to nearly US\$100 billion globally (Belle, 2010). Major media, hotel, and other, often multinational, corporations may not publicize it, but they make millions of dollars in profits (Kirk & Boyer, 2002; Leung, 2007; C. Taylor, 2002). Beyond revenues, there are many other indicators of the public's intense interest in the intersection of sex and technology: Researchers struggle to find men who have not viewed pornography (United Press International, 2009); up to a third of young people send sexual text messages (Constantinescu, 2009); the most frequently searched-for words on the Internet consistently include *sex*, *porn*, and many other sexual terms (Wordtracker, 2009; see also Spink, Partridge, & Jansen, 2006); the most shared stories on Facebook refer to sex (Smith, 2011); and some estimate that "over 60 percent of all visits on the Internet involve a sexual purpose" (Schneider & Weiss, n.d., para. 1; see Döring, 2009).

Sexual media content also increasingly is considered mainstream and acceptable: "Pornography has gone mainstream all over America. From movies to television shows to music videos and magazines, porn stars and porn iconography are everywhere, pointing to a national comfort level that few would have predicted even a decade ago" ("XXX-ceptable," 2003, para 3). If anything, the trend has accelerated in recent years, with porn stars, Playboy Playmates, and sexually promiscuous reality TV personalities gaining acceptance in popular culture; the sexually explicit discussions of popular radio "shock jocks"; the prominent display of erotic books in stores (Wyatt, 2004); new, edgier sexuality in advertising (Babej & Pollak, 2006); and more sexuality in television programming (see Rich, 2001; Strauss, 2010).

The potential negative and positive consequences of mediated sexual content, which are likely to be intensified, or at least modified, by presence, provide a rich and important context for the application of presence research and theory. Pornography (and other sexual media content) has long been the subject of controversy, with some arguing it is harmful in a variety

of ways and others arguing for its benefits (see, e.g., Malamuth & Billings, 1984; Weaver, 1991). Pornography, especially violent pornography, has been charged with causing people to objectify and disrespect women, to become callous and desensitized toward their mistreatment, to become sexually promiscuous, and to behave violently toward women (Donnerstein & Malamuth, 1997; Fisher & Grenier, 1994; Lipton, 1973; Mulvey & Haugaard, 1986; Steinem, 1980). Internet pornography also is associated with cybersex addiction (Griffin-Shelley, 2003; Schneider & Weiss, n.d.; although the classification is controversial; see J. E. Grant, 2008; Ley, 2012), and may have harmful effects on relationships (Cooper, Boies, Maheu, & Greenfield, 2000). Other negative consequences of pornography are said to include social alienation (Hundley, 2000); loss of identity, individuality, and sense of mystery (Heim, 1991), as well as unsatisfying sexual experience due to failure of technology (e.g., electric sex toys; Baldwin, 2000). Sexual technologies have also evoked concerns about mechanization and the replacement of "natural" sexuality. Juffer (1998) reviewed historical discourses regarding vibrators that demonstrate "the fear of the cyborg, the paranoia that women using machines would turn into women *as* machines—robots addicted to endless orgasms" (p. 90).

Although negative impacts have received more attention, consistent with a third-person effect in which we perceive greater harmful effects of pornography on others than ourselves (Lo & Wei, 2002), some argue that pornography and other sexual media content provide important educational and therapeutic (Springer, 1996), hygienic (Schneider, 2000; Steinberg, 1993) and safety (Russell, 2004; Schneider, 2000) functions. It may expand opportunities for exploration and learning (Hundley, 2000; Springer, 1996; Whitty, 2008) and lead to "a more public acknowledgement of diverse desires" (Zimmerman & Lewsen, 2007, "Good Ol' Family Porn" para. 8). Some feminists (McElroy, 1995; Strossen, 2000) argue that it provides a range of personal and political benefits to women (see Snyder, 2008, for an overview of the debates).

The evolution of presence-enhancing technology regarding sexuality also raises critical new ethical issues. Commenting on the US$5,000 life-size, anatomically correct, silicone love doll, Realdoll,[1] attorney and feminist M.C. Sungaila said, "Knowing that it's out there and that somebody thought this was a good idea—to make money off the complete objectification of women—is discomforting to say the least" (Lemons, 2000, para. 22). Steinberg (1993) looked to a day when people will ask, "Why settle for real sex with real people when you can have virtual perfection?...Why risk disease, embarrassment, disappointment, frustration, and heartbreak when you can program an ideal partner to satisfy you ideally?" ("Virtual Dancing," para 7). Although many of the technologies that raise concern, including virtual reality (VR) technologies described in sections below, remain in the lab at this writing, presence-evoking sexual media are evolving quickly. Rheingold (1991) noted that,

> Given the rate of development of VR technologies, we don't have a great deal of time to tackle questions of morality, privacy, personal identity, and even the prospect of a fundamental change in human nature. When the VR revolution really gets rolling, we are likely to be too busy turning into whatever we are turning into to analyze or debate the consequences. (p. 350)

Although predictions about the rate of technological progress have often been overly optimistic (Mims, 2010; Woolley, 1994), the progress continues. At this writing, new virtual assistant applications (Elgan, 2012), motion-based controllers (e.g., Leap Motion[2]), and virtual and augmented reality systems (e.g., Oculus Rift[3] and Google Glass[4]) show great

promise, and sexual content is being developed for most of them (Brown, 2013; Campbell, 2013; Segan, 2012).

For these reasons and others, and despite the culturally sensitive nature of the topic (Keilty, 2012; C. Taylor 2002), we believe scholars should turn their attention to the context of presence and sexuality. The following sections provide historical context, examine the characteristics of different forms of presence in response to mediated sexuality, and suggest avenues for future theory and research in this area.

EVOLUTION OF MEDIA TECHNOLOGY FOR SEXUAL MEDIA CONTENT

The technologies used to deliver sexual media content have evolved substantially, especially since the end of the 20th century. The evolution from technologies that transmit abstract symbolic representations to those that provide first-person interactive experiences suggests that media users are having increasingly vivid sexual presence experiences.

As Springer (1996) observed, "Historians of technology have pointed out that new inventions have been accompanied by sexual impulses throughout history" (p. 8). Tierney (1994, p. 9) reviewed how communication media have been used for sexual expression "from the invention of the printing press to the introduction of the novel, photography, films, videocassette recorders, computers, and pay-per-call telephone services" (see also Coopersmith, 1998).

Some of the earliest media with sexual content may be found in the Ice Age Venus figurines of Europe, which feature large breasts and buttocks sculpted with considerable attention to detail. Drawing from Absolon (1949) and others, T. Taylor (1996) went so far as to question whether these artworks were "made by men as the prehistoric equivalent of Playboy centerfolds" (p. 116). In addition, Taylor suggested the possibility that Stone Age phallic batons, which served as primitive dildos, may "have been a part of our own evolutionary and early cultural background" (p. 128).

T. Taylor (1996) also noted that the earliest preserved history of written records made reference to a multitude of sexual practices. The word *pornography*, taken from the Greek *porne* (whore) and *graphein* (to write), means "writings of harlots" or "depictions of acts of prostitutes" (Linz & Malamuth, 1993, p. 2). Writing as a vehicle to convey sexually arousing content grew with the proliferation of printing and literacy. Famous authors such as D. H. Lawrence (1928), Emile Zola (1928), Henry Miller (1935), and Frank Harris (1963), along with countless other authors, have published stories that describe the explicit details of sexual behavior.

The invention of photography in 1839 brought a new level of detail and impact to mediated experience, and sexuality was a subject of considerable interest and value to the first producers and consumers of photographic images. Koetzle (1994) referred to an 1874 police raid in which 130,248 pornographic photographs were confiscated to demonstrate "both the trade's production capacity and the wealth of public demand for [photographic] erotica" (p. 228). Nazarieff (1993, inside front cover) aptly described the presence evoked by the erotic photograph: "A woman you can almost touch, yet who is captured only on paper." Stereoscopic photography was also used extensively for photographs with sexual content (Nazarieff, 1993).

When motion pictures became a reality in the 1890s, more precisely capturing the experience of the human visual system, it is not surprising that the earliest content was sexual. Because real, unmediated sex does not occur in static frames, the introduction of a

medium able to capture rhythm and motion—key aspects of the sex act—became a particularly effective form to record and display sexual content. Pornographic films from the very early 1900s are still available (e.g., see Vintage Erotica[5]).

More contemporary electronic media, such as the video cassette recording (VCR), also have been exploited for their capacity to mediate sexual content. Weaver (1991) observed that, "Producers of pornography were among the earliest adopters of videotape technology for distribution of their software" (p. 330). With the advent of the videotape, consumers were able to take sexual content into the comfort of the intimate setting rather than experiencing it in a public theatre. "Prior to home video, pornography had a far smaller audience, limited mainly to men willing to venture into the muck of a Pussycat Cinema" (Rich, 2001, para. 14). With this new-found privacy, the user was free to have a more complete experience through simultaneously viewing and masturbating (or via activities with a partner). Video-on-demand services further facilitated privacy because the user need not even venture into the back room of a video store.

One crucial aspect of modern media technology's intersection with sexual content is its potential for interactivity. "As sexual content was the eminently marketable application that drove the VCR and camcorder markets, it's proven a 'killer app'—let's say 'lover app,' please—that has driven interactive Web video technology too" (Mosher, 1998, "Sex Without Socialism," para. 5).

The home video camera–recorder (camcorder), Web camera (Webcams; Rossney, 1995), text messaging (text sex; Jeyes, 2008), Internet compatible sex toys (Jardin, 2004), and DVDs with an array of interactive menu functions (Kennedy, 2003) enable not only privacy, but a sense of dialogic give-and-take previously available only in face-to-face interactions. Mobile and social media have provided new venues for interaction, including sexting and sexcasting (i.e., sending sexually explicit images, texts, and videos via cell phones and other technologies; Henderson, 2011; Shaw, 2012); Internet chat rooms, communities, and games; and virtual worlds (see Döring, 2009). Professional and do-it-yourself material available on-demand on desktops, laptops, tablets, and smartphones; a wide variety of adult blogs; live telephone and Webcam services; online dating services; adult social networking sites; and massively multiplayer online role-playing games, along with remote-controlled sex toys and Realdolls, are providing sexual media users with an increasing number of interactive and social options. Sexuality is a key feature in the virtual world Second Life (see Gilbert, Gonzalez, & Murphy, 2011), and other services are dedicated to a variety of interactive and social experiences (e.g., Red Light Utherverse[6] combines an adult 3D, avatar-based role-playing game with a personal profile-based social networking Website).

Looking into the future, inventors, theorists, and science-fiction writers have further explored the interactive and immersive potential of the media and sex equation. Examples include the amoebot bed, capable of becoming physically intimate with its occupant (Dery, 1996); artificially intelligent robot and android sex partners (Lemons, 2000; D. Levy, 2007; Yeoman & Mars, 2012); and Howard Rheingold's (1991) description of teledildonics, a hypothetical scenario in which long-distance partners, clad in sensor enmeshed bodysuits and virtual reality helmets, caress each other electronically. What each of these not-yet-realized libidinal technologies seems to maximize is the interactive and immersive qualities of the experience they offer. Even farther ahead, scholars, including telepresence pioneer Marvin Minsky (quoted in Tanner, 2006), have forecast drugs and devices that manipulate the brain

to create a sexual experience, with the possibility of recording and replaying them (Jaccoma, 2001; see also Halley, 2009).

To summarize, media have long been developed or adapted for the purposes of presenting sexually arousing content and to induce a sense of mediated presence in the user. The trend has developed from abstract and distant representations to more first-hand, interactive, and direct representations. In this evolution, interactivity and perceptual immersion have increased. In technologies that address the sexual needs of a single individual, the interactivity of nonmediated sexual activity is approximated, as in interactive DVDs. In technologies that facilitate the sexual interaction of two or more people, sensory input channels are maximized and coordinated through combinations of text, audio, Webcam images, remote-control, computer-interfacing devices and, perhaps in the future, virtual-reality headsets and datasuits.

CHARACTERISTICS OF PRESENCE IN THE CONTEXT OF MEDIA WITH SEXUAL CONTENT

Having explored the history of mediated sexuality, we can now investigate the specific dynamics of the presence experience as it is elicited through media with sexual content. Presence is a multidimensional concept, and, as noted above, a variety of dimensional structures have been proposed (see Freeman, 2004; International Society for Presence Research, 2000; Lombard & M. T. Jones, in press). Here we use the dimensions or types of presence identified by Lombard and Ditton (1997), based on their review of diverse literatures, to consider how each of six dimensions applies in the context of the intersection between media form and sexual content. The goals are to further explain and illustrate the nature of presence phenomena in general and specifically in the context of sexuality, as well as to provide the background for the discussion that follows regarding how we can fruitfully theorize about and study these interesting phenomena.

Social Richness

Informed by social presence theory (Short, Williams, & Christie, 1976) and media richness theory (Rice, 1992), Lombard and Ditton (1997) identify the first dimension of presence as social richness. As a characteristic of a medium, social richness generally refers to the amount of information that can be transmitted through one or many sensory channels; as a characteristic of the medium user, it refers to the subjective experience of warmth and intimacy in the mediated interaction. Social presence and media richness theories were developed to better match communication media and organizational tasks to maximize efficiency and satisfaction. Interactants are said to select a "lean" medium, such as e-mail, for basic information exchange and a "rich" medium, such as videoconferencing, for relationship building. Similarly, in the context of sexual intimacy, rich media and maximum intimacy are not always desirable. Thus interactants may choose from a variety of lean media (e.g., phone texting, text-based chat rooms, instant messaging) and rich media (e.g., interactive, real-time, remote sex toys) to create the desired level and type of intimacy.

Beyond current commercially available products, a variety of prototype technologies evoke presence as social richness in interesting ways. The Hug is a soft anthropomorphic object that uses sensors and actuators to record and transmit "hugs" (i.e., pressure, heat, vibrations) along

with voice via wireless telephony (Gemperle, DiSalvo, Forlizzi, & Yonkers, 2003). Pro Invention's KissPhone[7] records the physics of kissing (e.g., pressure, temperature, sucking force) when the device is kissed and transmits the "kiss" to another cell phone user. The Human Connectedness research group at Media Lab Europe has created a series of innovative intimate interfaces. Mutsugoto (Pillow Talk) is "an intimate communication device placed in the bedroom environment.... A specialized computer vision and projection system allows users to write or draw on their own bodies while laying [sic] in bed. Drawings made by one partner are transmitted to and revealed on the body of the remote partner" (Hayashi, Agamanolis, & McGrath, 2005; para. 1).

Realism

The second dimension Lombard and Ditton (1997) identify is realism. They describe two distinct forms: perceptual realism and social realism.

Perceptual Realism

Perceptual realism refers to a presence experience in which the mediated representation accurately simulates or reproduces the sensory experience that would be expected in the nonmediated context. Malamuth (1996, p. 25) observed that because "mass media did not exist in our ancestral history, our mechanisms for discriminating fantasy versus reality may not be sufficiently sharp to totally avoid any long-term impact of exposure on our feelings, thoughts, and behavior." J. D. Anderson (1996) and Reeves and Nass (1996) similarly pointed out the deceptive effect that media (particularly film) have on human perception. In *The Media Equation*, Reeves and Nass (1996) stated explicitly that,

> The human brain, at least at the level of primitive cortical arousal, does not have a switch that activates a different type of processing when media are present. As far as neural activity goes, mediated pictures and sounds produce the same results that would occur if the people, objects, and places were actually present. (pp. 115–116)

Extending this logic, we assert that the reason mediated sexual images arouse is that, on some primitive level, we respond to mediated bodies as if they were nonmediated bodies. It makes sense to suggest, then, that the more perceptually realistic sexually stimulating content seems, the more likely it is to evoke sexual arousal. Consistent with an evolutionary perspective, genital arousal covaries with explicitness (Laan & Janssen, 2007), but the relationship between perceptual realism of sexual stimuli and arousal should apply regardless. To illustrate, visual erotica at the beginning of the computer era that took the form of ASCII porn—figures created from numbers and letters in a nonproportional font (Newitz, 2001)— was much less arousing than today's digital high-resolution color photographs.

Film and video add motion, creating a more realistic and arousing stimulus. The latest audiovisual digital technologies provide even greater perceptual realism. Playboy was among the first media providers to introduce adult material in high definition (HDTV), with its Spice HD channel delivering "a picture so clear that many have compared it to looking through a window" (Swann, 2002, para. 3; see also "Skin-deep," 2004). In a 2007 CNN Money article, adult film director Joone, founder of the Digital Playground adult studio, said about high definition, "You

feel like you're there watching it live… It's more real" ("Adult Movie Industry's," 2007, last para.). Adult content makers are also beginning to use 3D technology to enhance realism (Albanesius, 2010).

Some producers of sexual media have focused on the single sensory channel of audio to create perceptually realistic experiences.

> Unlike stereo, where sound comes from either the left or the right, Virtual Audio provides spatial cues telling you if the sound is in front of you, behind you, close or far away. And it's digital—there's no analog tape hiss—so when you're listening, it feels like *you are there*. (Producer Ron Gompertz, quoted in Palac, 1997, p. 77; italics in original)

Recordings such as *Encounters Erotica*[8] and *Private Pleasure TraXXX: A Virtual Erotic Audio-Sex Experience*[9] use this technology to create vivid reproductions of sexual activity.

Efforts by manufacturers of adult novelty toys have also placed a premium on developing products high in perceptual realism. Companies such as TopCo and Doc Johnson have developed and produced artificial genitals out of various materials designed to replicate the qualities of real skin. Patented compositions with names like Cyberskin, Futurotic skin, Realistic skin, and Ultra-Realistic 3.0 skin demonstrate increasingly sophisticated attempts to evoke presence in the form of perceptual realism.

Social Realism

As opposed to perceptual realism, social realism describes a presence experience wherein the behavior and language of depicted social actors are true to life. The proliferation of amateur and reality pornography attests to the appeal of this kind of presence. Despite the lack of perceptual realism as a result of low quality recording equipment and lack of professional production skills, the ostensibly unscripted content remains exciting as a result of its authenticity.

Social realism is enhanced when the content is advertised as having been created by the person(s) depicted, as in pornography such as *Shot at Home Alone,*[10] an at-home and intimate production featuring a porn star filmed by her husband and apparently created for private use, and *Snatch'd: Stolen Home Videos,*[11] ostensibly genuine, private sex videos. By viewing the private and intimate moments of others, whether celebrities like Pamela Anderson or Paris Hilton, amateur actors, or, especially, just ordinary people, the spectator accesses a level of "real" intimacy that is unattainable in sexual media obviously created for viewing by a mass audience. Sexting and sexcasting (Henderson, 2011; Shaw, 2012) and the phenomenon of mediated exhibitionism (M. T. Jones, 2010), in which amateurs from all walks of life post photographs and videos of themselves or their partners on Websites that offer a public forum for commentary and evaluation, are additional examples of sexual media content that provide presence as social realism.

Note that the two types of realism are distinct but compatible. In fact, the optimum presence experience arguably would combine both perceptually realistic and socially realistic features so that the totality of the unmediated sexual experience can be most accurately duplicated.

Transportation

Beyond realism, or perhaps a precondition of it, is the issue of physical location. In a chapter that discusses the problem of physical location in the context of erotic Internet interaction, Waldby (1998) noted, "The pretext for any computer mediated communication between

participants is separation in space" ("Internet Erotics," para. 1). This, of course, can be extended to include any technologically mediated communication (computer or otherwise). As a result, the experience of presence in the mediated situation is contingent upon the perceived transportation of one, both, or all participants. Lombard and Ditton (1997) describe three ways that location is perceptually altered by presence as transportation: (a) "you are there," (b) "it is here," and (c) "we are together."

"You are There"

"You are there" transportation describes the medium user's perception of traveling into and being a part of a mediated environment. Virtually any pornographic film or video aims to bring the user into the "action." Weaver (1991, p. 231) observed that contemporary pornography typically uses a "'you are there as it happens' documentary style." This is magnified in formats where the camera and spectator (viewer) are acknowledged. In Hollywood style films and television soap operas, the camera is disguised, meaning the actors do not look into the lens and editing style and camera movement work together to deny the existence of the spectator. But in reality and amateur pornography, subjects are seen as aware of both camera and spectator, which sets up the pretext of a first-person experience for the spectator.

"You are there" transportation is also evoked through point-of-view (P.O.V.) pornography, wherein the subjective gaze of the performer becomes the gaze of the viewer. For example, the description of one of the over 40 entries in the DVD series *Peter North's P.O.V.*[12] proclaims, "Shot in first person P.O.V. - Peter brings you so close to the action you'll feel like it's your [d***][13] they're riding." Other series (e.g., *Anal POV*[14]) offer particular sex acts.

Videogames have a "you are there" quality when the player inhabits and controls an onscreen avatar, and this format has been appropriated for sexual content as well. The game *Playboy: The Mansion*[15] entices players to "slip into the slippers of [Playboy founder] Hugh Hefner," and a variety of similar titles are available for Xbox and PlayStation consoles as well as personal computers (see Saltzman, 2004). Even more sexually explicit are some Japanese *bishoujo* (pretty girl) games. In all of these games, the user assumes a persona in another environment and acts in that world (see M. T. Jones, 2005, for a review of the myriad ways these games evoke presence).

"It is Here"

A second form of presence as transportation, termed "it is here," brings the mediated representation into the space of the media user, rather than the other way around. Some sophisticated and realistic sex toys fashioned from casts/molds of the genitalia and other physical features of pornography performers have the potential to transport the anatomical likeness of the particular performer into the user's space. Advertisements for these products emphasize their connection to the flesh and blood performer they represent: The Kobe Tai Ultra Realistic P**** & Ass[16] is "a full size, anatomically correct model cast directly from her hot petite body"; the Blake Riley's Vibrating Ass[17] is a "perfect replica"; the David Anthony Realistic C***[18] was "molded directly from the star himself with attention to every detail"; and the Kimberly Williams Pleasureskin 36DD Breasts[19] are "molded directly from Penthouse Pet Kimberly William's 36DD breasts." One product even goes so far as to

include a video of the cast being made so that the connection between the reproduction and the original human being is especially salient to the user (Cohen, 1995).

These body-part replicas function to bring the performer (at least in fragments) to the consumer, especially when considered in conjunction with other sexual media. For example, a user who has seen many pornographic videos and photographs of Jenna Jameson is more able to appreciate the nuances of the toy because of its likeness to the unique characteristics of her body. This presumably results in a greater feeling that she "is here" from the user's perspective. Kits have also been produced that enable a user to form a mold of his or her own genitals. A description of the Clone-A-Willy kit[20] says it lets you "Keep that special someone home, even when he's far away!" The manufacture of artificial sex organs to stand in the place of an absent lover is apparently not a new phenomenon. Hill and Wallace (2011) present a photograph of an 18th-century Venetian dildo with a husband's portrait painted at the base. Clearly this object was meant to offer a very rudimentary sense of "it is here" transported presence to the wife for whom it was made.

Beyond the reproduction of fragments of performers' bodies, reproduction of the entire body is available in the form of a love doll. The function of the full-sized replica love doll is touted by advertisers of the Jill Kelly Sex Doll,[21] who announce, "You've seen her on the screen. Now see her between your sheets!" Here the advertisers are openly telling the reader that he or she can take Jill Kelly home—a clear reference to presence as "it is here" transportation.

Beyond the tangible replicas in these examples, adult entertainment company Digital Playground is working to develop holographic imagery intended to sexually arouse (Kennedy, 2003). In addition to again demonstrating how sexual media content is a driving force behind innovation in media technology, this would represent another means of transporting mediated people to viewers for sexual purposes.

"We are Together"

The third and final form of presence as transportation specifies a shared space in which mediated communicators experience a sensation of "we are together." This type of presence as transportation is often used to describe such experiences as teleconferencing (see Lichtman, 2006; Muhlbock, Bocker, & Prussog, 1995) and multiuser virtual reality (see Lanier & Biocca, 1992). But even text-based interaction can evoke a sense of interacting together in the same space between people who are actually in different physical locations. What is crucial is the real-time (or apparently real-time) nature of the interaction. In her discussion of erotic online text-based digital communication, Waldby (1998) wrote, "This mutual and simultaneous interaction effectively implicates the bodies of both participants in a particular kind of shared space … produced by the digital assemblage and its embodiment by the user" ("Internet Erotics," para. 3). Beyond real-time, text-based chat are mediated sexual encounters in multiuser online virtual environments, such as Red Light Center[6] (a virtual world for adults only; Lynn, 2006) and Second Life (Wagner, 2007), in which participants interact via avatars in a common virtual space.

In an article for *Wired* magazine titled, "The next best thing to being there," Robert Rossney (1995) attested to the importance of interaction and feedback within a more direct form of mediated erotic encounter. Through an investigation of an online peep show service called Virtual Connections, Ltd., Rossney discovered that he was aroused based on feedback from the woman with whom he was interacting. He wrote, "It's one thing to look at a picture of a scantily

clad woman. It's another thing entirely to ask her to remove an article of clothing and see her respond by whipping off her panties and flinging them aside" (Rossney, 1995, p. 4). Clearly the interactive nature of this sort of experience goes a long way toward reconstituting some of the lost sense of "we are together" transported presence in the mediated erotic encounter.

Taking the erotic possibilities of transportation as shared space further are products that use remote control technology to permit physical stimulation over distance. Products such as the Remote Control Butterfly,[22] the Vibrating Wireless Thong For Him,[23] and the Shots Remote Vibrating Egg[24] permit a person holding the remote control to covertly stimulate a person nearby who is wearing the device receiving the signal. Remote stimulation can also be transmitted via cell phone text messages (Fulbright, 2008; Lynn, 2004b). The Sinulator (Lynn, 2004a) allowed one Internet user to control the sex toy of another user in real time. Live webcam sites such as VSEX[25] charge customers for the opportunity to control mechanical sex machines that stimulate remotely located performers. The site's creator, Allen Stein, said it offers "a new level of intimacy… People come back again and again because they've consummated their relationship with the performers" (Ruberg, 2009, "Deviant Encounters," para. 2; see also Ruberg, 2008). These technologies again illustrate the central role of real-time interaction in the mediated erotic encounter. Although a person at the receiving end of the remote signal is unlikely to mistake the vibration of a remote control egg for direct contact with his or her partner, the knowledge that the partner is controlling the device and determining the level of intensity of the sensations that the receiver feels at that moment creates a sense of physical connection and proximity for both of them.

These remote controlled sexual devices still do not produce the sense of reciprocity so important to the unmediated sex act because they only transmit signals and cannot receive them. In her discussion of online text-based erotic encounters, Waldby (1998) made the observation that the technology used to interact "both substitutes for the face-to-face negotiation of proximate sexuality and simulates certain aspects of that proximate relationship, involving the projection of a limited kind of telepresence through the *simultaneous* and *interactive* production of pleasure in the other's body" ("Introduction," para. 7; emphasis added). Although Waldby referred exclusively to text-based sexual encounters (referring to more elaborate forms as "literal minded and cumbersome"; "The Sexual Relation Does Not Take Place," last para.), the principle importance of reciprocal communication is well illustrated.

Some innovators have devised technology capable of allowing the real-time two-way interaction integral to physical intimacy. The remote sex technology offered (or at least proposed) by F*** You, F*** Me[26] permits users to interact sexually with Windows-compatible genital drives that act as surrogates for their partner's sexual organs. The High Joy Internet-based service enables two-way text, voice, and video communication, along with reciprocal control of sex toys (Jardin, 2004). Mojowijo[27] uses Wii remote attachments and Skype video conferencing to similar effect, and Xcite!Touch[28] provides remote haptic interaction in the virtual world Second Life (see Denning, 2012). Even more complete and elaborate is Dominic Choy's designed and patented computer interfacing sex doll, in which "using signals from the Internet as well as sound and touch sensors… [allows] a user wearing a virtual reality headset to have virtual sex with someone in another part of the world…" (Rohde, 2001, para. 4).

Likely the most sophisticated and comprehensive solution to the problem of creating shared space in the mediated erotic encounter was theorized by Rheingold (1991), who described his notion of teledildonics this way:

> Before you climb into a suitably padded chamber and put on your 3D glasses, you slip into a lightweight bodysuit, something like a body stocking, but with the kind of intimate snugness of a condom. Embedded in the inner surface of the suit, using a technology that does not yet exist, is an array of intelligent sensor-effectors – a mesh of tiny tactile detectors coupled to vibrators of varying degrees of hardness, hundreds of them per square inch, that can receive and transmit a realistic sense of tactile presence, the way the visual and audio displays transmit a realistic sense of visual and auditory presence. (p. 346)

Using this imaginary technology, participants in different locations would be able to interact with each other sexually in a vivid shared virtual space.

Immersion

Another form of presence—presence as immersion—occurs in two varieties: psychological and perceptual. Both are relevant to the context of sexuality.

Psychological Immersion

Drawing from Palmer (1995) and Quarrick (1989), Lombard and Ditton (1997) defined psychological immersion as a feeling of being involved, absorbed, engaged, and engrossed ("Presence as Immersion," para. 3). Cybersex addiction provides a good example of how psychological immersion functions. Despite controversies regarding appropriate labels for phenomenon and its underlying nature (J. E. Grant, 2008; Ley, 2012), millions of Americans are said to be cybersex addicts (Schneider & Weiss, n.d.). Moreover, although much of these addicts' media use involves highly iconic (rather than perceptually rich or immersive) communication via chat rooms and e-mail, they become so deeply involved in the experience that their partners describe it as equivalent to an off-line affair (Hertlein & Piercy, 2006; Schneider, 2000).

Perceptual Immersion

Perceptual immersion refers to the involvement of multiple sensory channels in the mediated encounter. If one can only see or hear a stimulus, the experience is said to be less immersive than if one can see, hear, touch, taste and smell it, in part because the involvement of multiple sensory channels permits cross-validation of experience. The unmediated sex act is extremely sensually immersive because participants experience the sight, sound, feel, smell and taste of each other's bodies. Producers of sexual media content seek to approximate these sensations by creating perceptually immersive presence experiences. For example, the 2009 version of Digital Playground's Website[29] proclaimed that the company's innovative products would stimulate all of the user's senses and thereby bring their fantasies a step closer to reality.

One of the key challenges that face innovators who are attempting to create immersive mediated experiences (sexual or otherwise) is the involvement and coordination of multiple sensory channels. Eric White's Virtual Sex Machine[30] device coordinates haptic stimulation with visuals from CDs and DVDs so that "what happens on the screen, happens to you"; RealTouch[31] does the same thing for films streamed over the Internet. Virtual Sex Sets[32] provide visual, aural, and haptic dimensions of experience by coordinating an interactive DVD of a particular porn performer and a sex toy reproduction of the genitals of that

performer. And the Jessica Drake Talking Love Doll[33] approximates the sight, touch, and sound of a human being by featuring prerecorded sex talk.

Beyond mere involvement of multiple senses, the coordination of those senses is crucial to fostering a perceptually immersive presence experience. If one sensation provides information that contradicts another, the presence experience will be lost.

Social Actor Within Medium

A type of presence labeled social actor within medium (Lombard & Ditton, 1997) or parasocial interaction (Horton & Wohl, 1956) involves a pseudointeraction in which a user of a one-way medium experiences something akin to face-to-face interpersonal interaction with the mediated performer. Because of its ability to sustain a level of feigned intimacy through the gestures of private interaction, parasocial interaction is exploited by media producers seeking to create a sexually arousing experience for consumers. Even as early as the mid-1950s, when Horton and Wohl (1956) first theorized the parasocial encounter, they cited examples of its sexual applications in a discussion of the popular radio program *The Lonesome Gal*, which featured a seductive feminine voice speaking intimately in a first person monologue to an audience of single men at the end of the day. Today, products like Ear Erotica's Audible Arousals[34] provide a similar but more explicit and higher fidelity first person experience.

Adult magazines and Websites frequently feature photographs of models who make direct eye contact with the lens of the camera and, by extension, the viewer of the photograph. This technique, known as direct address, was identified by Horton and Wohl (1956) as key to evoking parasocial interaction. This in and of itself implies a degree of intimacy because the viewer is being acknowledged, on some level, by the gaze of the model. Videos containing scenes of a performer who is masturbating, "dirty talk" videos, and the point-of-view (POV) genre of pornography all permit high levels of parasocial interaction. First person interactive DVDs, with titles such as *Interactive Sex with…*, *Virtual Sex with…*, *Playing with…*, and *Total Interactive Control of…*,[35] carry this parasocial interaction further by permitting the user to have a limited amount of input and feedback in the manufactured encounter. With the DVD remote control, users are able to seem to interact with performers, choosing sexual positions, and other aspects of the parasexual experience.

Some innovative adult software produces parasocial encounters using digitally created characters. VirtuaGuy and VirtuaGirl[36] are freeware programs that feature strippers on the computer desktop. The characters greet users each morning, remind them about their appointments, and dance and strip on demand. The Virtual Valerie series challenges the user to bring a digitally generated woman to orgasm using a computer mouse (Springer, 1996). And, although not available commercially, an infrared-sensitive light projection called INBED, creates the interactive image of a virtual girlfriend in the user's bed: "She's perfectly quiet, but once you sit or lie down, she responds to your every move. Lie on your back, she snuggles up right next to you in a log position. Curl up in the fetal position, she spoons" (Lagorio, 2008, para. 2). More sophisticated are the artificially intelligent programs that allow users to cultivate a relationship with a virtual person. As advertisers of Girlfriend[37] note, "Now you can have your own girlfriend…a sensuous woman living in your computer!... watch her, talk to her, ask her questions, and best of all have sex with her." The ad continues, "Your girlfriend starts with a vocabulary of over 3000 words and will continually learn new words, feelings, and ideas.

This program truly grows the more you use it." By experiencing this change and growth over time, a user of the Girlfriend software, Sergio Virtual Boyfriend/Kari Virtual Girlfriend,[38] Virtual Woman,[39] VirtualFem,[40] or others could conceivably develop a strong sexual and emotional relationship with a person who does not exist. In fact, because these programs are so interactive and adaptable, they may blur the line between parasocial interaction and true interpersonal interaction to the point that a malfunctioning hard drive may constitute the death of a lover and friend.

Medium as Social Actor

This final variation of the presence experience that should be addressed in terms of its role in mediated sexual content "involves social responses of media users not to entities (people or computer characters) within a medium, but to cues provided by the medium itself" (Lombard & Ditton, 1997, "Presence as Medium as Social Actor," para. 1). Novelty products such as the Boyfriend Arm Pillow (Allen, 2004) and the Hizamakura Lap Pillow,[41] which is "shaped just like a beautiful woman's lap, kneeling in Japanese-style" and "gives the best re-creation available," constitute media that function as social actors. So do products with a more directly sexual application, such as dildos, vibrators, masturbation sleeves, penis pumps, sex machines (e.g., see Archibald, 2005), and various other sexual devices that are designed to give pleasure but do not rely upon interaction with other people (real or virtual). Products such as Realdoll and the (hypothetical) amoebot discussed above exemplify the concept of medium as social actor because sexual arousal derives from interaction with the object itself. When a person makes use of any of these sexual media, it is likely that they actively suspend disbelief and generate internal sounds and images to heighten the sense of presence and arousal, a point that may apply to some extent to all of the types of presence discussed and how they function with regard to sexual content (Klimmt & Vorderer, 2003; Retaux, 2003).

THEORY AND RESEARCH IMPLICATIONS OF PRESENCE AND SEXUALITY

We have now reviewed the evolution of technologies related to sexual media content and explored how some of these technologies are used (or likely will be used) to evoke six different types of presence experiences. We turn now to ways we can theorize about and study these presence phenomena to extend our understanding of interpersonal and mediated communication as well as presence itself.

Presence, Sexuality, and Interpersonal Communication

Considering the roles and functions of presence in sexuality can help us understand a variety of interpersonal communication phenomena. Two examples are highlighted here: (a) the positive and negative impacts of presence on the long-distance relationship (LDR), and (b) the role of presence in encouraging and discouraging the formation of intimate human-to-human relationships.

Research with couples involved in LDRs indicates that the separation associated with them has at least some negative consequences for the relationship (Holt & Stone, 1988; Van Horn et al., 1997). Van Horn et al. began with the position that "distance affects a relationship by

restricting opportunities for partners to engage in intimacy processes" (p. 25). Of the LDRs that had dissolved by the second phase of their study, 60% reported distance was the most influential factor in ending the relationship. Based on interviews with LDR couples, Sahlstein (2004) concluded that for successful LDRs, "being 'apart' enables being 'together'" because it "creates a desire in the partners to want to have quality time with one another when they come together" (p. 700). However, for others, "together *constrains* apart" because "time together provides a standard for interaction that cannot be achieved when the partners are apart" (Sahlstein, 2004, p. 699). Meanwhile, some individuals in LDRs employ coping mechanisms to manage the challenges of separation. Holt and Stone (1988) noted that study participants with a visual cognitive style used daydreaming as a coping strategy to deal with separation in LDRs, and Shoup, Streeter, and McBurney (2008) confirmed the finding of McBurney, Shoup, and Streeter (2006) that "men and women commonly smell their partners' clothing during separation to feel close to their partners" (Shoup et al., 2008, p. 2955).

All of this suggests a potentially important role for presence in the degree of success of LDRs. It seems likely that couples in LDRs will increasingly use evolving media technologies during separation to evoke the sense of presence of their partners and thereby provide not just time "together" but also key aspects of intimacy (i.e., descriptive self-disclosure, reliable alliance, and companionship) as identified by Van Horn et al. (1997), as well as versions of mediated physical intimacy discussed earlier. It is reasonable to hypothesize that these couples will experience greater relationship satisfaction and be less subject to both the enabling and constraining effects during the cyclical phases of being apart and being together identified by Sahlstein (2004). Not all types of presence or presence technologies should be equally effective; presence as social richness and as transportation may be most critical.

Presence may have an important role in encouraging or discouraging the formation of physically and emotionally intimate interpersonal relationships in the first place. Human intimacy is a complex phenomenon and a multidimensional concept with sexual, emotional, social, intellectual, and recreational components (see Berscheid, 1985; Dahms, 1972; Heller & Wood, 1998; Hook, Gerstein, Detterich, & Gridley, 2003; L. D. Scanzoni & Scanzoni, 1988; Schaefer & Olson, 1981). Factors that encourage or discourage development of intimate relationships include self-differentiation (Kerr & Bowen, 1988), prior developmental tasks and experiences (Collins & Sroufe, 1999; Erikson, 1959), and media portrayals (Holmes, 2007; see Henline, 2006 for a review).

Presence seems likely to be another increasingly important factor in the process. At least some people who are apprehensive about interacting in person already use media (especially media that do not provide cues that people use to disqualify others, such as physical appearance) to "get to know someone and 'break the ice' before going on dates or engaging [in] other forms of face to face interaction" (Henline, 2006, p. 105) and building intimate relationships (see also McKenna, Green, & Gleason, 2002). New and evolving technologies that allow users to control various aspects of these early and subsequent interactions and the resulting sense of presence experienced by the interactants should make this phenomenon more prevalent.

On the other hand, presence technologies may also discourage the formation of intimate relationships. Although the isolating effect of media is certainly not new—Henline (2006, p. 3) noted the Andy Warhol quotation, "When I got my first television set, I stopped caring so much about having close relationships"—the increasing use of many of the media discussed above could replicate enough of the experience of physical intimacy to discourage media users from

forming rich human-to-human relationships. In particular, media that evoke the type of presence in which the medium is perceived as a social actor are likely to have this effect. This may already be occurring in countries such as Japan, where Sparrow (2008, para. 4) noted that "pornography, masturbation aids, Internet porn sites and social networks that lead to 'virtual relationships', soaplands [a type of brothel featuring nonpenetrative sex] and Japan's widespread prostitution industry all allow men outlets for sexual fulfillment while not fulfilling other needs." Scholars should explore the interactions among the types of presence and the variety of other factors in the literature to determine when presence-evoking media are more likely to encourage and discourage successful intimate human relationships.

Presence, Sexuality, and Mediated Communication

Studying presence and sexuality can also help us better understand important media processes and effects. Two examples are briefly considered here: (a) presence as a moderating variable in the effects of pornography and other sexual media content, and (b) the dynamics of parasocial interaction and relationships.

The effects of pornography have been the focus of media (and other) theory and research for decades (for reviews, see Malamuth, Addison, & Koss, 2000; Malamuth & Billings, 1984, 1986). Although they find support for both indictments and defenses, Malamuth et al. (2000) countered evaluations by others (Fisher & Grenier, 1994) in arguing that the cumulative research shows a consistent relationship between pornography use and sexually aggressive attitudes and behaviors. They favor a multivariate cumulative-conditional-probability model that considers a variety of moderator variables that "previous researchers have often failed to properly examine" (Malamuth et al., 2000, p. 57), including

> the cultural background milieu of the person (e.g., a culture that emphasizes or de-emphasizes equality between the genders), the individual's home background (e.g., open or highly restricted education about sexuality), [the] individual's relatively stable personality characteristics and predispositions (e.g., whether dispositionally hostile or not and one's intelligence level), the particular content of the stimuli (e.g., sexually violent or not), the current temporary emotional state of the person (angered or not), and the environment in which exposure occurs (e.g., permissive vs. nonpermissive for aggression. (p. 55)

Another variable that may help us understand pornography's effects is presence. For instance, E. Kronhausen and Kronhausen (1959, 1964) suggested that pornography may have the positive effect of acting as a catharsis or "safety valve" for the pent-up frustrations of potential sexual offenders. Although there is little supporting evidence for catharsis theory in the context of violence (e.g., Geen & Quanty, 1977; Watt & Krull, 1977) and sparse, contradictory evidence in the context of sexuality (Howard, Liptzin, & Reifler, 1973; Kutchinsky, 1973; McCormack, 1988), researchers have focused on the manifest media content rather than "the mind of the viewer" (Copeland & Slater, 1985, p. 356).

Kutchinsky (1973) begins to take a more psychological approach in the following:

> The abundance of pornographic books could be expected to serve as "safety valves" only for the better educated (or more intelligent) potential sex offenders. Picture pornography, on the other hand, is not affected by this objection; on the contrary, one might expect that these full-color magazines and films with the reputation of "leaving nothing to fantasy"

would be very well suited as a means of sexual stimulation for persons with poor imagination, persons who need "something more concrete." (p. 177)

This reasoning suggests that media that evoke high levels of presence (especially perceptual realism and immersion) have a greater potential to generate a level of fantasy in the user and would be better suited for providing a cathartic experience.

Many of the claims for pornography's negative effects on attitudes and behaviors (e.g., Check & Malamuth, 1986) are based on Bandura's social cognitive theory, which holds that people learn not only from directly experiencing things that happen to them (including the consequences of their actions) but by observing the experiences of others (Bandura, 1986). It seems reasonable to assume that media that provide a strong sense of presence (particularly perceptual realism, "you are here" transportation, and medium as social actor) that is more equivalent to direct experience than otherwise possible will prompt deeper learning and, depending on the content, more prominent negative effects. Other theories of learning also emphasize the importance of learning by doing, including experiential learning (Kolb, 1984) and embodied cognition (see M. L Anderson, 2003; Rambusch & Ziemke, 2005). Although claims regarding pornography have not been based on these theories, by logical extension they suggest that enhancing presence with sexual content might amplify negative effects.

An examination of presence and sexuality can also contribute to our understanding of parasocial interaction and relationships. Although the degree to which they are functional remains a topic of debate (Jensen, 1992; Turner, 2004), parasocial phenomena have become increasingly common and have been studied in contexts that include celebrity fandom (Giles, 2000, 2002), soap operas (Rubin & Perse, 1987), local news (M. R. Levy, 1979; Rubin, Perse, & Powell, 1985), game shows (Horton & Strauss, 1957), home shopping (A. Grant, Guthrie, & Ball-Rokeach, 1991), and talk radio (Rubin & Step, 2000). Giles (2000) noted that a parasocial relationship has advantages over actual relationships because the user controls the selection of the ideal partner, who can have "all manner of fantasy attributes" (p. 65). He highlighted a familiar context:

> Perhaps the most blatant use of parasocial interaction as a substitute for real relationships is in the use of pornography. Indeed, the phenomenal success of the pornography industry may be all the evidence we need to demonstrate the psychological importance of parasocial interaction. Masturbation with the aid of pornography is an extraordinary psychological phenomenon, far beyond the explanatory scope of evolutionary theory, but the small amount of psychological research into responses to "erotica" largely consists of laboratory-based experiments that tell us little about the real-life *use* of pornography. (p. 65; emphasis in original)

It seems likely that the increasing fragmentation of society (Giles, 2000), the mainstreaming of sexual media, and the current and emerging media technologies described earlier that evoke presence as social actor within medium (and medium as social actor) will combine to increase the prevalence and significance of parasocial relationships, requiring media scholars to expand their models of these phenomena. Research that explores the attributes of media form and content, as well as characteristics and goals of users that lead to different levels of intensity and satisfaction in this most personal type of parasocial interaction and relationship, should lead to insights that apply more broadly as well. The interactive, artificially intelligent sensual and sexual companions discussed above have particular potential to expand our understanding as

they provide a relatively rich form of interaction (e.g., as compared to television viewing) but still provide only a simulacrum of human-to-human social interaction.

Presence, Sexuality, and Presence Theory

Scholarly attention to presence in the context of sexuality holds substantial promise for increasing our understanding of the processes, antecedents, and consequences of presence itself across a variety of contexts. It also can assist researchers in refining several key elements of presence theory.

It is challenging to use technology to create the illusion of the in-person presence of another person, but creating the illusion of physically and/or emotionally intimate interaction with another person arguably represents the ultimate challenge for those who design presence-evoking technology. Whether the evoked experiences represent primarily presence as social richness, immersion, transportation, realism, social actor within medium, or (especially) medium as social actor, producing the complex, subtle, verbal and nonverbal, physical, and emotional elements of human intimacy requires an understanding of which properties and combinations of properties of technology, content, form, and context, and of the technology users, lead to which types of presence experiences. So the ultimate challenge for technology designers is also the ultimate opportunity for presence scholars and researchers to develop and refine their current, relatively primitive understanding of these factors. In short, any comprehensive and useful theory of presence must account for presence in this most rich and personal, and personally important, aspect of life.

Aside from the inevitable but unpredictable heuristic benefits of applying current research paradigms and theories to any new area, examining presence in the context of sexuality should help us refine key elements of our theories about presence. Three of these elements are briefly discussed here, the "uncanny valley," "the book problem," and sex differences.

Masahiro Mori's (1982) concept of an uncanny valley suggests that as an artificial (or mediated) entity looks and moves more like a human, we have increasingly positive responses to it until a certain point when the resemblance becomes eerie and disquieting, and emotional responses become negative. When the resemblance is so close to the real thing and the difference is imperceptible, our responses again become positive (see Thompson, 2004). Current sexual media technology is mostly primitive, and yet at least many people seem willing and able to suspend what should be a strong sense of disbelief and obtain a positive experience. As the technologies evolve—for example, "subsequent generations [of Realdolls] will inevitably acquire increasingly sophisticated animatronics and eventually be wedded to robotics" (Lemons, 2000, para. 44)—it seems likely that responses will reflect Mori's uncanny valley, as it becomes eerily disturbing to have sex with a not-quite-but-almost-real virtual person. A hint of this may be seen in Lemons' report of a visit to the Realdoll factory:

> Far in the back is a bizarre spectacle: eight headless female bodies hanging about a yard or so off the floor, suspended from long chains with hooks affixed to the top of the necks. The bodies are, quite simply, gorgeous -- with the sort of firm, round T-and-A that you only find in gentlemen's mags. It's a disturbing sight, reminiscent of plucked chickens on display in a Chinese restaurant. One is torn between lust and horror. (2000, para. 30)

Presence scholars will be able to evaluate the range of emotional responses to these technologies as they evolve. Further, they will better understand the causes, nature, dynamics, and consequences of the uncanny valley phenomenon in a context that permits an unusually complete consideration of relevant variables.

The context of sexuality also represents a valuable opportunity to explore the book problem (Biocca, 2003; Schubert & Crusius, 2002), the surprising (to some) ability of highly iconic, for example, text-based media to evoke presence. In proposing his capacity limited cognitive construction (CLCC) model of spatial presence, Nunez (2007) evaluated the ability of several models to account for this phenomenon and noted that the successful ones recognize that, even though we refer to high-presence media, presence is a response not to the content and form of a medium but to the technology user's mental representations of that content and form. Little is known about what characteristics of iconic and low-immersion media stimuli lead to the creation of mental representations that evoke presence. Because mediated sexual content that leads to presence, as indicated by physiological arousal, can be found in everything from novels, phone texting (see Layson, 2009), and interactive chat rooms to immersive virtual worlds (and because even without media, humans can create mental representations that evoke the same response), sexuality is an ideal context for identifying those characteristics and testing different models of presence. Key questions concern the roles of automatic and controlled responses and the role of the expectations and unique experiences of media users in evoking different types of presence (see Nunez, 2007).

A final component of presence theory that could be refined by examining presence in the context of sexuality concerns the role of biological sex differences in presence experiences. A growing set of studies (e.g., Lachlan & Krcmar, 2008; Lombard, 1995; Lombard, Reich, Grabe, Bracken, & Ditton, 2000; Maurin et al., 2006) have revealed differences between male and female presence responses to a variety of media, but we understand little about the reasons for the patterns of these differences. There is a more substantial and consistent set of research on sex differences in the area of sexuality. Consistent with assertions by evolutionary psychologists (Bailey, Gaulin, Agyei, & Gladue, 1994; Malamuth, 1996), males seem to be more aroused by visual sexual stimuli (Karama et al., 2002), with females most aroused by tactile stimuli (Herz & Cahill, 1997). J. C. Jones and Barlow (1990, p. 278) reported, based on participant self-monitoring, that "women were equally likely to have externally provoked and internally generated sexual images. Men, on the other hand, were more responsive to external cues." And in their experiment examining gender differences in erotic film preference, Janssen, Carpenter, and Graham (2003, p.243) found that for males, "watching as an observer" and "imagining yourself as a participant" were equally sexually arousing, whereas in females, only "imagining yourself as a participant" was related to sexual arousal. Conclusions such as these might be useful in explaining, for example, a pattern of findings (Lombard, 1995; Lombard et al., 2000) in which only females experience greater presence with larger images when watching television segments from a variety of genres. Although the connection is highly speculative, and it is nearly impossible to separate culture and biology, perhaps larger images are more important for females' ability and/or desire to imagine themselves as participants. In any case, findings and theories regarding sex differences in the context of sexuality are likely to be heuristically valuable not only in helping presence scholars understand interesting and important differences between men and

women in the context of mediated sexual experiences, but also for presence experiences in other contexts.

CONCLUSIONS AND FUTURE RESEARCH

Although scholars have examined presence phenomena in many diverse areas, sexuality has mostly been ignored. In addition to wanting to avoid political and other controversies, it seems likely that this is related to a common tendency in journalists' reports about pornography to maintain "an arm's-length disdain passing for objectivity" (C. Taylor, 2002, para. 4), in which sexual media content is treated "as a sociological phenomenon, just not one that is part of any culture that they—or by implication any cultured [news consumers]—feel part of" (C. Taylor, 2002, para. 5; see also Keilty, 2012). But academics should not hesitate to acknowledge they are part of a culture and species for which sexuality is important, and they should explore interesting, important and common phenomena related to presence in this context.

And these phenomena are worthy of study. As this review has shown, although the people who create sexual media content and technologies to deliver it do not use the term presence, that is exactly what they are pursuing. Perhaps more consistently than in any other context, presence is the most important goal for sexual products, from magazine images to realistic, interactive dolls. And this pursuit has contributed to a fascinating and ongoing evolution of technologies. Moreover, unlike presence in many contexts, these products encompass every type of presence, from realism to medium as social actor (Lombard & Ditton, 1997).

Although current products may be lacking, the technologies will likely evolve quickly: Today's cyberdildonics "products are merely version 1.0" (Baldwin, 2000, "Cybersex Isn't Very Sexy," para. 3), and "given the pace of technological innovation, sexual experiences straight out of science-fiction novels may not be very far away" (Hundley, 2000, p. 60). The technologies and their successes and failures will provide a diverse array of scholars with valuable opportunities to expand their understanding of presence phenomena and the implications.

Based on this review, we suggest several avenues for research and scholarship:

1. Identify key variables. We recommend careful exploration of which variables have the greatest impact on different types of presence; that is, which characteristics of media content, form, user, and environmental setting are most important in evoking presence in the context of sexual arousal (the degree and type of interactivity and the number of senses that are providing input are likely to be among them). Closely related to this, following Short et al. (1976), Rice (1992), and others, we need to better understand which variables most strongly affect how users choose specific media in this context, that is, how people match medium and task to optimize their experience (bandwidth and synchronicity are likely to be key).

2. Investigate theoretical propositions. Although they represent only a starting point, we hope that scholars will investigate the theoretical propositions presented in the Theory and Research Implications section above regarding the role of presence in LDRs, the formation of intimate human relationships, the effects of pornography and other sexual media, parasocial interactions and relationships, the uncanny valley, the book problem, and sex differences. No doubt those and other explorations will lead to additional propositions.

3. Consider issues from diverse perspectives. Scholarship on presence and sexuality will benefit from multiple interdisciplinary perspectives. For example, the embodied or grounded cognition perspective in philosophy (supported by evidence from neuroscience; see Barsalou, 2008) holds that "the environment, situations, the body, and simulations in the brain's modal systems ground the central representations in cognition" (Barsalou, 2010, p. 717), suggesting a rich context for examining mediated sexuality. French sociologist Maffesoli (1993) described ancient erotic instruments (with modern echoes) that created imagery and simulacra and, with their use, provided "symbolic correspondence with other members of the collective" (pp. 102–103), serving as a powerful socializing agent. This suggests intriguing questions about the broader functions of mediated sexuality. Drawing on the work of sociologist Bourdieu (1990), Czaja (2011, p. 4) described a habitus of presence that "involves the habitual and culturally ritualized embodying of technology [and] implies a naturalization of the disembodiment of self implicit within mediated interactions and occurrences of presence"; these notions and the larger cultural perspective on presence (including the posthuman, transhuman, and cyborg, which Czaja discussed) have clear relevance to sexuality. And Harper (2010) examined how, while he and his colleagues invented communication technologies, they focused on replicating the bodily mechanics of human communication (roughly, physical presence) but avoided concern with human intention and expression. This work suggests the need for scholars, as well as designers, to look beyond the physical elements of mediated sex to emotions and identity, and to the complexity of interpersonal relationships. These and other perspectives would enrich scholarship on this topic.

4. Use a wide variety of methods. In addition to diverse perspectives, we encourage scholars in this area to use a wide range of methods in their work. This would include lab and field experiments utilizing self-report questionnaires and psychophysiological measures (see Janssen, Prause, & Geer, 2007; Koukounas & McCabe, 2001), surveys, content analyses, textual analyses, discourse analyses, standardized and qualitative interviews (including Delphi interviewing of experts), case studies, focus groups, ethnography, historical, and any other formal or informal scholarly method or combination of methods.

5. Focus on ethical issues. Finally, among the most important and compelling issues raised by the technologies and phenomena discussed here are the ethical questions they raise. Among these are the (im)morality of having sex with androids and of replacing nonmediated sex and relationships with idealized virtual versions, and the implications of these for our psychological health (e.g., the ability to distinguish acceptable virtual and unacceptable "real" behavior), the social cohesiveness of society, and eventually even changes in the nature of being human (Adams, 2010; Gutiu, 2012; Hayles, 1999; D. Levy, 2007; Rheingold, 1991).

We believe these and related issues should be considered central in the scholarship on presence and sexuality. Despite the cultural and other sensitivities, it is clear that scholars have much to gain by studying and theorizing about presence and sexuality.

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ENDNOTES

1. For information on Realdoll, see http://realdoll.com

2. Information about Leap Motion is available at https://www.leapmotion.com/

3. See http://www.oculusvr.com/ for information on Oculus Rift.

4. Information on Google Glass is available at http://www.google.com/glass/

5. The Vintage Erotica Web site is at http://www.vintageerotica.com/

6. Red Light Utherverse and the Red Light Center are accessible at http://www.redlightutherverse.com/

7. Information on PRO Invention's KissPhone can be found at http://www.gizmag.com/the-kissphone-for-remote-kissing/11532/

8. Encounters Erotica. (1998). *Encounters Erotica* [CD]. [Producer unknown].

9. Private Pleasure Traxxx. (2005). *Premium XXX Pleasures, Volume 1.* [CD]. Boise, ID, USA: LLC Ultimate Innovations

10. Information about *Shot at Home Alone: Selena Silver Volume 1* is available at http://shop.shotathome.com/Merchant2/merchant.mvc?Screen=PROD&Store_Code=SAH&Product_Code=SAHDVD0158

11. Snatch'd: Stolen Home Videos is a series of videos; information is available at http://www.cduniverse.com/sresult.asp?HT_Search=TITLE&HT_Search_Info=snatchd%3A+stolen&style=ice

12. Quote comes from the first paragraph of promotional text for the video. North, P. (Director). (2006). *P.O.V.#5* [DVD]. Retrieved on August 26, 2011, from http://www.cduniverse.com/productinfo.asp?pid=6836598&style=ice

13. In order to protect *Human Technology* from association with sexually explicit keywords in search engines, asterisks are inserted in certain words. In direct quotes, such as this, the edited word(s) are placed within square brackets.

14. POV (point of view) videos include a wide variety of titles. Examples can be found at http://www.simplyporndvd.com/genres-pov_point-of-view/

15. Information on *Playboy: The Mansion* is available at http://www.mobygames.com/game/ps2/playboy-the-mansion/adblurbs

16. The quote appears in the advertising description of the Kobe Tai UR3 Ultra Realistic P**** & Ass, with information at http://www.xmeg.com/store/detail/Kobe-Tai-Ultra-Realistic-Ass-Pussy-2514.html

17. The quote comes from the first paragraph of the promotional material for the Blake Riley Vibrating Ass product, available at http://www.tlavideo.com/gay-blake-riley-vibrating-ass/p-270264-3

18. The quote can be found in the advertising blurb for the David Anthony Realistic C***; information is available at http://www.docjohnson.com/index.php/dj-superstars/collections/titanmen/titanmen-signature-cocks-david-anthony-realistic-cock.html

19. The quote appears in the advertising blurb for the Penthouse Pet Collection Kimberly Williams PleasureSkin 36DD Breasts product; information at http://www.topco-sales.com/products/penthouse-pet-collection-kimberly-williams-pleasureskin-36dd-breasts

20. The quote can be found in the third paragraph of the Clone-A-Willy product description at http://www.extremerestraints.com/realistic-dildos_40/clone-a-willy-kit_757.html; more information on that product, and the Clone-A-P**** product, can be found at http://www.empirelabs.com/

21. The quote comes from the promotional text for the Jill Kelly sex doll, with information at http://www.xtoyszone.com/322-sex-doll.htm

22. Information on the Remote Control Butterfly can be found at http://www.xandria.com/index.php?getpage=store&getsec=catalog&page=item&xpage=category&itemid=92&theme=7

23. Additional information on The Vibrating Wireless Thong for Him can be found at the Adam & Eve site, at http://www.adameve.com/lingerie/mens-wear/sp-vibrating-wireless-thong-for-him-5559.aspx

24. The Shots Remote Vibrating Egg is available at http://www.amazon.com/Shots-Remote-Vibrating-Egg-Green/dp/B0039TAPEK/

25. Information about the VSEX service is available at http://vsex.com/

26. For information regarding F*** You, F*** Me, see http://web.archive.org/web/20070321013931/http://www.fu-fme.com/

27. Information on Mojowijo is available at http://www.mojowijo.com/

28. Haptic interaction tools for Second Life can be viewed at the Xcite!Touch Web site at http://www.getxcite.com/index_v2.php

29. The current Web site of Digital Playground can be found at www.digitalplayground.com

30. The quote, and more information, can be found on the Virtual Sex Machine Web site: http://vrinnovations.com/index2.htm

31. The Real Touch Web site is at http://www.realtouch.com/

32. Virtual Sex Sets were widely available from adult product catalogs (e.g., Spice TV's) in the mid-2000s.

33. Information about the Wicked Lover Jessica Drake Talking Love Doll is available at http://www.69pleasuretoys.com/wicked-lover-jessica-drake-talking-doll-p-3808.html

34. Audible Arousals are described at http://earerotica.com/audible-arousals/ (see especially "Audible Arousals vs. Erotica").

35. See descriptions of interactive adult DVDs at Adult DVD Marketplace, at http://www.adultdvdmarketplace.com/search_cat_0_5_1_popular.html

36. The official Web sites for VirtuaGuy and VirtualGirl are http://www.virtuaguy.com and http://www.virtuagirl.com, respectively.

37. The advertisement appeared in the online version of Sexxy Software's adult product catalog, which is available from http://secure.netreach.net/starbyte/sexxy/Sent%20to%20Dennis/page12.html

38. For more information about Sergio Virtual Boyfriend/Kari Virtual Girlfriend see the Web site of Lhandslide Studios: http://lhandslide.com/

39. For information about Virtual Woman, see http://virtualwoman.net/index.htm

40. For information about VirtualFem, see http://www.virtualfem.com/

41. The Hizamakura Lap Pillow is described at http://www.japantrendshop.com/hizamakura-lap-pillow-p-64.html; a short video is available from CBS News at http://www.cbsnews.com/video/watch/?id=660986n

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