

Theorizing Interpersonal and Technological Dimensions of Privacy in the Exchange of Sexual Communication

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Abstract: As technology continues to evolve, so too do privacy concerns individuals have about technology. This is especially true when individuals share highly sensitive, personal content through technology. When individuals sext, they are sharing sexually explicit messages, photos, and videos with another person. Two theories are interrogated in how they may apply to sexting and privacy: communication privacy management theory and privacy calculus. Utilizing these theories, privacy is highlighted in this article as a negotiation process between partners and technologies. Individuals must consider who they share material with and the channels they use, and these theories can help in developing a better understanding of these processes. Sexting can be a positive influence on adults' romantic relationships, whether serious or casual; yet, they need to be able to engage in these behaviors in ways that encourage trust both interpersonally and with their technology.

Keywords: sexting; privacy; communication; sexual technology

1. Theorizing Interpersonal and Technological Dimensions of Privacy in the Exchange of Sexual Communication

The sending and receiving of personal sexual materials continues to be a growing area of interest for scholars who research sexuality, romantic relationships, and psychological well-being, to name just a few of the many fields where this work is taking place. This sending and receiving of sexual material is known as sexting. Though definitions vary, most define sexting as sending and/or receiving a sexual message, whether text, photo, audio, or video, via either a smartphone or computer [1], often featuring one's likeness [2]. Numerous types of individuals sext, including adolescents and young adults [3] as well as older adults [4]. Motivations for sexting range from body image concerns and the potential for self-esteem boosts [3,5] to relational reasons, including relationship maintenance and pressures within one's relationship to sext [6].

As research into sexting continues to grow, it is important to not just consider why individuals sext or even how they sext. Research into sexting often focuses on specific channel choices, as outlined by Courtice and Shaughnessy [7]), which can lead to limitations in understanding broader trends around a topic. Of particular importance in the coming years will be understanding the privacy tensions associated with sexting. Individuals are clearly willing and able to share highly personal, sexual material with others; yet, they must choose who these others are and determine if they are trustworthy, while also determining the technologies that they can or cannot trust in the process. As technology continues to evolve, particularly with the ongoing growth of artificial intelligence and large-scale data collection by technology companies (see Coduto [8], chapter 5, for a full review), individuals will have to start considering their digital sexual practices more carefully.

Thus, the goals of the present article are threefold: First, I aim to outline and synthesize existing research into sexting and privacy concerns, in particular focusing on the differences between adolescents and adults who sext and the potential influences on their privacy perceptions. I also consider privacy as it relates to nonconsensual sharing, as this practice



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specifically offers nuanced insights into how privacy is perceived and managed. In this section, I also note the limitations of existing research into privacy, specifically considering how privacy could be better defined and understood in this context. Second, I consider how we can study privacy and sexting in the future by bridging literature and research in interpersonal trust and trust in technology. I also emphasize understanding privacy as a negotiation between parties (both human and technological) in this section. Research often shows that people who sext trust a technology even if they do not trust a specific partner [8]. Finally, I also propose potential outcomes that might be studied in this context. Instead of studying privacy for privacy's sake, it is worth understanding what benefits the actual people who sext might derive from feelings of improved privacy and, perhaps, improved security. This likely will extend to other settings, allowing for greater technology and media literacy.

I specifically focus on an analysis of communication privacy management theory (CPM [9]) and privacy calculus [10] in understanding the perceptions individuals have as they sext. These theories offer a valuable starting point for understanding sexting as both a risk-taking behavior and as a positive relational activity. CPM and privacy calculus have theoretical overlaps and boundary conditions that make them ideal to be studied in tandem in this particular context. Sexting creates a context where privacy is not determined by just one party, but it is instead a shared negotiation between multiple individuals and the channels they utilize.

This review article therefore also addresses needs in the field of sexting as outlined by Courtice and Shaughnessy [7]—namely, better integration and consideration of theories (in this case, interpersonal and technological communication theories) as well as expanding beyond a focus on a given medium to technology as a broader factor within sexting.

2. Privacy Perceptions and Sexting

When individuals sext, they are sharing highly personal information about themselves, whether via text, audio, photo, or video [1,11]. Though it may be easier to identify an individual in a photo or video, personal information can still be gleaned from messages written to another person. Even when individuals take steps to create a sense of privacy (such as blurring a face from a photo), other aspects of the content may still be identifiable; this is especially true if the receiving party shares with additional third parties and can verify the identity of the original sender. Thus, privacy concerns involve both the technology and the involvement of a partner and/or other parties. When individuals sext, privacy becomes a negotiation, not just an individual practice.

The revealing of this information beyond designated parties could be harmful to the sender of the sext. This could include experiencing cybervictimization (such as online harassment [12]) and the sharing of one's personal content to a mass audience [13]. When this happens, individuals may experience threats to their well-being, including harm to mental health, as well as ramifications such as job loss. Thus, considerations of privacy are imperative in understanding sexting, particularly as technology continues to evolve, and allowing for greater sexting in interpersonal relationships but also increasing the potential risks of sharing. The growth of artificial intelligence, with the ability to seamlessly edit faces into content or create text content that can imitate a sender, further highlights the need for greater privacy practices.

Further, sexting often occurs in established relationships [8] or as part of a ritual of relationship development [14]. As a result, sexts are often sent to a known other, typically an established romantic relationship partner. Because individuals know the partner they are sexting, the sense of threat may be reduced. However, previous research has suggested that individuals can experience intimate threats [15]. These intimate threats are privacy threats that can come from romantic partners and other family members. Just because individuals know each other, it does not mean they cannot violate each other's privacy, which is another key reason to consider privacy as a negotiation. These violations could happen because individuals know each other's secrets and are able to share them; this is

also possible given that many in serious relationships share access to devices, including sharing passwords to different devices and accounts [15]. An established relationship is thus still open to threats to privacy. Even a miscommunication between two partners could result in the improper sharing of sexual content [16].

Similarly, research has also investigated multiparty privacy conflicts [17]. These conflicts involve publishing photos or videos of others without having permission to do so, usually sharing this content on social media. Again, the problem often arises among known others—an individual has a friend or loved one who decides to share their material online [17]. In this case, because much of the focus is on social media, multiple parties are involved in both the sharing and viewing of the content. Both intimate threats and multiparty privacy conflicts are understood as privacy violations of one individual, when in reality multiple individuals bear responsibility for what happens with this content.

Though many people sext in the context of established relationships, there are variations between adults and adolescents. Adolescents may be more likely to sext with a relatively unknown partner, particularly as their social circles are expanding through schooling and extracurricular experiences. In considering sexting among adults and adolescents and their approaches to privacy, it is likely that stark differences will arise. Some previous research already suggests this, and this work provides a foundation for future research questions.

2.1. Sexting Risks among Adults vs. Adolescents

Though both adolescents and adults engage in sexting, they often utilize different channels, with a wide range of motivations for engaging in the behavior. Some overlap exists between these two groups, but it is also important to highlight their differences. Of particular note is that privacy concerns are different among these two groups, in part because there are legal ramifications when underage individuals share sexual content [18]. Though not all adolescents engage in sexting, a recent meta-analysis suggests approximately 15% of adolescents have sent a sext, and nearly 30% have received a sext [19]. Laws vary, but engaging in the sharing of sexual content can result in punishments ranging from misdemeanor charges to sexual offender status if an underage teenager is involved in the sexual exchange [18]. This is often true regardless of whether the sexting was consensual or not. Even in cases where a teen has consented, by virtue of their age they are unable to fully consent. It is also noteworthy that laws vary both state by state (in the United States), as well as from country to country, with most work currently focusing on legal implications in Western contexts [18,20].

Existing research has explored how social media channels, such as Instagram, may be utilized for sexting among adolescents [21]. Younger individuals may take advantage of social networking sites to share sexual content, in part because they are able to connect with others they may not know in person [22]. Social media may provide an avenue to connection that is not otherwise available. Affordances of channels such as Snapchat, which features disappearing messages, may help adolescents to feel that these are the best options for sexting; for many, this may also feel like a more intimate channel choice [6]. Yet these channels also raise questions about how material is protected, if it is protected, and what role a channel or platform plays in protecting privacy. Individuals can lie about their age when they sign up for a platform; they can also lie about their age to a new partner. While lying about one's age among adults often occurs in online dating contexts [23], this becomes significantly riskier if a teenager lies to seem older to a potential sexting partner.

Existing research suggests that adolescents themselves perceive sexting to be a risky endeavor (e.g., De Ridder [24]). This age group is more likely to send sexual content to new or relatively unknown others, which can make discussions around sharing sexual content and privacy practices difficult and uncomfortable [25]. Adolescents in a Belgian study often worried about being victimized or bullied if they engaged in sexting [24], a concern that may be warranted based on other research suggesting that adolescents often forward sexual messages without others being aware [19].

This is further coupled with the rising adoption of mobile phones among teenagers [22]. Increasingly younger individuals constantly have technology with them, which enables them to create and send sexual content [6]. In many instances, adolescents may not be thinking of potential long-term implications from sexting or may think that they themselves are safe from negative outcomes [26]. The ease of access to mobile phones and social networking sites makes it easy to share content, perhaps thoughtlessly.

Adults face similar considerations regarding sexting, but adults are also often sexting in a different relational context compared to adolescents. Whereas adolescents may be thinking about using sexting as a way to connect with a new partner, many adults who sext are sending this content in the context of established romantic relationships [8,27]. Thus, adolescents may be thinking about how to share and the implications of sharing with unknown others, carrying legal risks; adults, though, may be trying to maintain their ongoing relationships, or may even be navigating a long-distance relationship [3,28]. Adults in established relationships may feel there is less risk involved in sexting due to the fact that they are engaging with a known partner. Further, research suggests that sexting can be largely positive for adults who sext in this context [27,28]. Despite these potential positives from sexting, most existing research still focuses on privacy as an individual practice and not a relational management tool.

Thus, adults can still experience feelings of uncertainty in their relationships. Individuals may experience uncertainty about a relationship's trajectory or about a partner's role within a relationship [29]. Partners could interfere with goals including improving or managing sexual communication. Thus, partner uncertainty may be an important factor to consider when attempting to understand privacy perceptions among adults who sext. This is particularly evident with newer research suggesting uncertainty can specifically be connected with sexting [27]. Individuals may generally trust a partner while still feeling uncertain about how a partner manages the sexual content they have been sent. Therefore, while adolescents may have to work to manage their privacy with relatively unknown others, adults are often faced with negotiating with a long-term partner. However, for both groups, they can still experience the sharing of their content beyond the intended audiences—in some cases, for nefarious purposes, and particularly when one's sexual imagery is included.

2.2. Non-Consensual Image Distribution and Revenge Porn

Key to understanding privacy concerns when individuals sext, regardless of age, are the potential negative outcomes from sexting. In this section, I focus not on the potential legal ramifications as outlined above (e.g., what may happen when an adult sexts with a minor). Instead, I consider negative outcomes related to breaches or mismanagement of privacy, regardless of any legal standpoint, and emphasizing exposure to unintended audiences. As previously mentioned, research has indicated that sexting can have positive outcomes, especially for adults [3,8,28]. However, these benefits are accompanied by risks, and often these risks are part of a calculus that individuals have to consider before—and often after—they have shared sexual materials with another person.

An individual's sexual materials may be shared beyond their intended audience in a variety of ways. Here, I focus on two of the most common ways that sexual material is shared beyond the original receiver: non-consensual intimate image distribution [30] and revenge porn [31]. Though these two terms are often considered to cover similar experiences [32], it is important to investigate the nuances between these forms of harm. Revenge porn is ultimately one form of non-consensual intimate image (NCII) distribution or abuse [33], though it is important to highlight this particular form in the discussion about privacy and sexting.

NCII distribution occurs when individuals share or forward a person's sexual content without their permission or knowledge [19,33]. This could include sharing content with a friend or another third party, despite the original creator not wanting or intending for an audience beyond the original receiver. NCII distribution is particularly harmful because

it focuses on the distribution of images which, even if they are edited, can still include identifiable information. Revenge porn as a form of NCII distribution is often committed by an ex-partner in hopes of retribution, usually due to the end of a relationship [30]. Whereas NCII distribution broadly considers a wide range of potential audiences who could intercept or become third parties for this material, revenge porn focuses on how these images are transferred to and even featured on actual pornographic websites. Specific websites have been created for sharing this type of content. The goal of sharing revenge porn is in the name: revenge, often including financial and emotional harm to those who have had their images posted [33].

What NCII distribution has yet to consider is how material beyond photographs may be shared and result in potential harm. Considerable research has called for the sharing of sexual content to be considered a form of sexual abuse [33,34]. As technology continues to evolve, other aspects of sexual messages are likely to become identifiable. This could include, for example, an individual's Snapchat, which they expected to disappear, being screenshotted [6]. Even more likely is the dissemination of one's written texts being shared with others. A screenshot of a text message could include an individual's name as well as their phone number or username. Similar implications arise when considering audio dissemination as well. It is important to consider expanding the definitions of mediated sexual abuse, especially as individuals increasingly experience this sharing.

3. Interpersonal Communication Privacy and Technological Privacy

Given the wide range of risks that are involved in sexting, it is clear that privacy and perceptions of privacy are critical to understanding this behavior. This is especially true when thinking about future research and the ongoing developments of technology. Additionally, considering privacy and how it can be attained (or at least perceived) may be critical for ensuring a more positive overall approach to sexting. Given that sexting has genuine benefits for those who do it, researchers should consider ways that individuals may improve their privacy when engaging in this activity. It is especially critical to understand how individuals achieve privacy through discussions and negotiations with partners, as receivers of this content are saddled with the responsibility of how to manage it.

Thus, I first consider how interpersonal trust may play a role in individuals' feeling confident in sexting. This involves both communication privacy management (CPM) practices, as well as interrogating and understanding one's feelings about it, and with a partner. I also consider how trust in technology may develop and influence sexting. Even if an individual does not trust a partner, certain technologies may allow them a greater sense of security when sexting. This sense of confidence in technology may be of notable importance for individuals who wish to sext at the beginning of a relationship and to do so with a sense of security [14].

4. Interpersonal Trust and Privacy

When individuals start relationships with one another, a sense of trust is critical for the trajectory of the relationship [35]. Trust is not just important for having a sexual connection with a partner, whether physical or mediated; trust enables numerous other relationship activities and goals. However, considering sexuality specifically, trusting one's partner often relates to improved outcomes related to discussions regarding sexually transmitted diseases and reducing risks of infection [36]. As relationships progress, trust typically grows, as individuals become familiar with one another and each partners' patterns.

One theory that may help to illuminate processes of trust, or at least decisions to trust or not when sharing sexual materials, is communication privacy management (CPM) theory [9]. CPM is akin to interdependent privacy, where privacy is reliant not just on an individual but is also influenced by those others with whom they share information [37]. Within CPM, three core components are utilized to understand how individuals manage their private information and determine whether or not to share with others [38]: privacy ownership (who owns a given piece of information); privacy control (how the information

is handled and shared, if it is); and privacy turbulence (what happens when information is shared in ways that are not expected or that break control rules). As individuals determine with whom and how to share information, they often engage in these three processes. As a result, these processes offer opportunities to better understand how individuals determine how to share sexual material, particularly as they come to understand and trust a partner.

4.1. Privacy Ownership

Ownership of information, and therefore the person who determines if information is private, is typically the original creator of that information [9]. In the case of sexting, this would be the person who crafts a sext—whether a photo, audio, video, or text message. This perception of original ownership is often apparent in existing research, especially research that considers negative outcomes from sexting. For example, adolescents often consider that the sender of a sext will face greater consequences than a receiver [26]. A sender of a sext also has to be intentional in their crafting of this material, perhaps making them seem more “blameworthy” and responsible in the exchange of information—and thus, clearly, they are the original owners of the content as well.

When individuals receive a sext message from an original owner (in CPM terms), they become co-owners of the information [9], in this case, a co-owner of the sexual message. However, there are distinctions drawn between being a co-owner and an authorized co-owner. Authorized co-owners are those individuals who are willingly given information; adults who consensually share sexts with each other would be authorized co-owners of each other’s sexual content (typically those who are in established relationships [28]). A person can be a co-owner without being authorized if a sext message is forwarded to them and they are not the original intended recipient; they still now have ownership of the information, but they ultimately were not authorized by the original owner to see or share that information. The forwarding of messages that adolescents often engage in, for example, would be one way that individuals become co-owners without being authorized [19].

Critical to understanding the privacy ownership aspect of CPM is understanding the negotiation process individuals must engage in to determine who owns what information and what will happen with that information [39]. According to CPM, the original owner determines what any authorized co-owners may do with information they have; this includes whether and if they can also share that information [38]. Thus, in understanding sexual exchanges, negotiations of who may or may not see the content are important to investigate. For many individuals, there is not a definitive conversation about sexting or what it will entail [8]; instead, individuals start sexting and only have to determine later what rules might exist for their content. Recent research suggests that individuals may wish for these conversations to occur before they engage in sexting but are not sure how to navigate such negotiations [25]. Sexting also opens up further exploratory possibilities, as sexting often involves both individuals sharing sexual content in tandem. This may increase feelings of responsibility for the information, as the parties in a sexual conversation are both owners and co-owners and may be considering the consequences for both in terms of sharing beyond intended audiences.

Going forward, conceptualizations of privacy ownership in sexting research may shed light on how individuals determine whether they are going to sext. This extends beyond self-esteem or sexual reasons [3] and should instead focus on whether individuals truly feel ownership of their material. For instance, many individuals may not actually feel that their material is theirs once it has been sent to a partner. Yet CPM argues that once an individual has deemed their sexual material private, it should always ultimately be their responsibility and their information. If this is not the case, however, then individuals who are granted access to this information have even more responsibility than originally intended or expected. This would help to illuminate the dynamics at play when individuals sext. These dynamics may also influence later outcomes, including self-esteem or relationship maintenance.

Some research has begun to draw connections between privacy ownership and sexting (among adults [8]; among adolescents [40]), but this existing work is largely descriptive in

nature. Applying CPM and considering privacy ownership to sexting may certainly shed light on the behavior; however, sexting may also present a range of interesting theoretical boundaries conditions to this component of CPM.

4.2. Privacy Control

One way that CPM proposes individuals may exert control over their private information is through the creation of rules for private information and whether or not that information is shared [41]. These rules are termed privacy control within CPM. Rules are crafted via two possible paths: core criteria and catalyst criteria [9]. Core criteria are informed by individuals' existing privacy beliefs, whereas catalyst criteria are developed in response to a change, typically in one's relationship.

Core criteria are influenced by a range of factors, including individuals' personal experiences and their belief systems. Core criteria regarding sexting may be influenced by early influences regarding sexual behavior broadly, such as rules regarding who one will have sexual contact with physically. Some individuals may have established ideas about what sexual content they can or cannot share, regardless of who their partner is. Core criteria are ultimately more stable forms of rules regarding privacy of sexual information [41]. Research into adolescents who sext, for example, has shown that they likely have core criteria that follow sexual scripts around who engages in sexting as well as other online sexual activities [42].

Catalyst criteria, on the other hand, develop in response to changes and external forces. A key way that catalyst criteria may develop in a sexting context is when sexual content is shared with unexpected third parties or in unexpected ways [19,33]. A newly established romantic couple may discover that they have different core criteria regarding the sharing of sexual content, with one individual wanting to share with friends and the other wanting the information to stay private between the two relational partners. Catalyst criteria would be developed regarding the sharing of content with both parties. In this case, the partners together may decide to enforce a privacy rule regarding sharing only within their relationship and not with outside parties.

Core and catalyst criteria function as rules for how partners will or will not share their private information; these rules are guided by ownership of information between an original owner and the authorized co-owner. In sexting, individuals should be making it clear whether content will be shared or not. Though it is often expected that couples would not want their sexual content shared beyond the relationship, numerous platforms have made it possible for couples to perform sexual activities for audiences beyond themselves (such as OnlyFans [43]). Thus, it is imperative to begin theorizing how the sharing of sexual content manifests. Though considerable research focuses on sharing as a potential negative, and indeed it often is [33], technological shifts also allow partners to create and share with designated audiences. Catalyst criteria in particular may adapt to this shift in potential audiences for these sexual materials.

4.3. Privacy Turbulence

Despite the implementation of rules for sharing private material, individuals may (and often do) break those rules. When rules are broken and information is shared unexpectedly or in a way that goes against the original owner's desires, privacy turbulence occurs [9]. The existing privacy structures become turbulent, as there is limited adherence to the rules. This turbulence can shift perspectives within the relationship itself, as turbulence can represent a violation of trust and the agreed-upon management of information [38].

Privacy turbulence merits study within the context of sexting; though research often explores the outcomes of sharing sexual materials beyond intended audiences, there is little in the way of exploring how this unexpected sharing impacts the relationship that it occurs in. It is likely that this unexpected sharing is vastly different for those at the start of a relationship [14] compared to those who are in more established relationships. Rules may not be as clearly established in new relationships; individuals may be guided by their

own individual core criteria regarding sharing content. Established relationships may be much more susceptible to true turbulence. Relationship researchers should take it upon themselves to better understand how this sharing impacts the actual relationship that it takes place in.

Communication privacy management theory provides three conceptual keys for better understanding the management of sexual content in a variety of relationships: privacy ownership, control, and turbulence can all shed light on practices of sexting. CPM is particularly applicable in this context, given that it is technology agnostic. Instead of considering specific channels, CPM considers the rules within relationships, which can transcend a given channel. This allows for a broader understanding of the negotiations that may take place when individuals decide to sext, as well as how these individuals may navigate relational upheaval when content is shared in unexpected ways with unintended audiences. However, although CPM largely focuses on aspects of the relationship in understanding privacy management, technology itself also certainly plays a role in the management of sexual content and information.

5. Technology Trust and Privacy Perceptions

Individuals who choose to sext are able to negotiate how their content is handled by partners who receive this content. However, just because they are able to negotiate and create rules for their content, it does not mean that these rules will be followed. For some of those who sext, this means that instead of trusting a partner, they instead consider the technology that they are using and how that technology allows them to control their materials (or not).

When discussing technology in sexting contexts, it is important to consider the many forms the technology itself may take. Individuals may utilize social media broadly or social networking sites specifically when considering sharing materials [21]. They may also make determinations based on the actual hardware they are using, whether it is a smartphone, a laptop, or other physical device. These considerations are reflective of concerns outlined by Courtice and Shaughnessy [7], who argue that the existing body of sexting research often focuses on specific channels—such as a study focused solely on sexual sharing via Instagram or via SMS text messaging. Yet individuals have numerous channels to choose from, and they can weave these channels throughout their interactions (e.g., modality weaving [44]).

Further, those who sext have to evaluate whether they feel their information is protected by these different channels. Though many individuals utilize social networking sites (SNS), their use is not reflective of an inherent trust in these channels. In fact, many users express concerns about the privacy of information in these spaces [45].

Thus, as individuals determine what to share on what channels, they often engage in privacy calculus [10]. Privacy calculus is determined by an individual's willingness to disclose (typically on SNS) information about themselves and whether or not they receive support for their disclosure [46]. Individuals must engage in calculus, though, because disclosing information in these spaces could carry risks. Therefore, privacy calculus models seek to understand what level of privacy risk is worth a given level of perceived support. Applying privacy calculus to sexting offers potential theoretical and practical benefits. From a theoretical perspective, privacy calculus can have its boundary conditions probed, extending from typical SNS disclosures (such as emotional disclosures [10]), and focusing on sexual content as a form of disclosure that carries risks and benefits. Perceived support influencing the calculus in this context could include self-esteem increases or sexual gratification from sexting [3]. Alongside further theorizing privacy calculus models, though, the application of this framework to sexting may also reveal important insights for those who sext as they consider channel choice and risk management and mitigation. In this section, I therefore consider privacy calculus as it may manifest in two spaces: Within digital channels, along with their requisite perceived affordances; and considering the

hardware itself that users physically engage with when creating and sharing personal sexual content.

5.1. Channels and Affordances

When individuals decide to sext with a partner, they must make a choice about which channel they will utilize in this sharing [27]. Channel choices range from SNS like Instagram [21] and Snapchat [6] to text messaging [1] and video calling [27]. Various channels carry different levels of risk, whether that be unintentional exposure to a mass audience or sharing with an unintended recipient. Though channels carry different risks, the way users perceive and utilize the channels may influence their risk perceptions. Thus, what channels are perceived as affording a user may influence that user's experience of privacy and risk mitigation.

The affordances of a channel refer to the functional properties of a channel, which take shape in the interaction between a channel's user and its features [47]. The different aspects of a channel that a user determines are useful in achieving their goals may make channels more or less appealing for use; this is particularly true when they are engaging in privacy calculus. Do features of the channel assist them in sharing private, sexual information in a safe way that leads to perceived rewards, or does the channel and its feature add to the sense of risk a channel has?

Perceived social affordances of channels include how editable the channel is or not (does the channel allow for messages to be easily edited); how accessible the channel is or is not (is the channel easy to use); the amount of social presence a channel allows (do partners feel physically present when they communicate via the channel); and how private communication is in a channel (in this case, does the channel make communication visible to third parties, such as posting on a friend's Facebook page) [47]. This is not an exhaustive list of channel affordances; instead, this represents just some of the different ways an individual can utilize channels to meet their communication needs. These are particularly of interest when attempting to understand how individuals sext and how they share information safely across different channels [27]. When individuals are unsure of how a partner may handle their sexual content, channel features may become the reassuring element in these exchanges. Editability, for instance, may mean an individual is able to edit their photos, removing their face or other identifying features before sending this material.

However, individuals do not perceive and utilize all channels in the same ways. Numerous individuals use Snapchat when they sext [6,8]; they choose this channel in part because Snapchat promises that content will disappear once it has been viewed [48]. Yet it is possible to screenshot or duplicate what has been sent via Snapchat, meaning the promise of disappearing content can be violated [49]. Individuals who choose to sext via Snapchat must then consider whether the technology truly affords a lack of persistence [47]; for example, if this is what they are hoping will protect them. A key challenge with technology and sexting is that not only does technology evolve, but so too do the users who take advantage of it. Part of why affordances are useful in understanding sexting is that affordances can help to shed light on the ways people adapt to and transform communication technologies—even when the technologies are not changing themselves.

Previous research has suggested that perceiving certain affordances can help individuals to experience greater gratification and self-esteem from engaging in sexting [27]. Affordances can also influence the privacy calculus process, as suggested in research exploring privacy calculus on SNS [10]. Theorizing sexting behaviors alongside affordances also allows for refinement of understanding affordances themselves. Not only can affordances help individuals achieve communication goals, but affordances may also improve an overall communication experience. The tension, of course, rests in that affordances can also be utilized to manage or invade privacy, particularly in the sharing of sexual content. Thus, the application of perceived social affordances to sexting behaviors will continue to be a rich area for theoretical development and understanding. This is especially true in considering how affordances may relate to the privacy calculus that sexters engage in.

5.2. Hardware Concerns

Part of making a channel choice is also selecting the actual hardware that one will use in creating and disseminating sexual content. Considering the hardware people use when they sext, this also takes numerous forms. Individuals can sext via their smartphones, their laptops, and other connected devices, such as tablets [2]. Smartphones in particular hold great appeal for individuals who sext, as they can create sexual content for a partner anywhere at any time [1]. Yet understanding the physical hardware individuals choose can be difficult, as it is often intrinsically tied to channel choices that exist online. An individual who wants to communicate sexual desires via Snapchat, for instance, is likely going to create and disseminate that content via a smartphone.

Thus, what I would like to especially focus on in considering physical hardware is users' perceptions of hardware. Of note, when considering sexting, are the relationships between multiple devices; namely, it is worth understanding how individuals perceive the cloud (e.g., Burda and Teuteberg [50]). Many individuals backup and store material in cloud-based services; the idea behind the cloud is that individuals can access greater storage than may be available on their physical devices. Yet the cloud itself is ultimately another computer, just one with greater storage capacity. As a result, numerous individuals feel hesitation about the cloud, especially when sharing sexual content.

Some of these hesitations stem from previous data breaches of cloud-stored content [51]. These data breaches have both revealed the extent of what companies keep and have access to, as well as the susceptibility of these services to outside attacks. These concerns connect back to discussions around NCII, as many of these breaches were utilized to spread revenge porn (including images of celebrities [52]). Thus, for individuals who sext, both their own hardware but also the hardware they utilize by extension may not feel sufficiently safe for storing their sexual content. These concerns may dampen potential positive outcomes suggested by privacy calculus. There exists an incredible potential to investigate privacy calculus in this space, as there may be determinations based around cloud services and hardware that have yet to be explored. If one cannot trust either their immediate hardware (smartphone, computer) or the cloud through which they save and/or access content, there are critical implications for how sexual material may or may not continue to be shared. This also raises questions as to how much risk is too much risk when sharing this content.

6. Overlaps of Technology and Interpersonal Trust

Though I have highlighted interpersonal privacy considerations via communication privacy management theory and technology privacy considerations via privacy calculus separately, these two areas certainly have overlap in understanding how individuals decide to engage in sexting, as well as the outcomes they experience from sexting. Individuals do not sext a partner in a technological vacuum, nor do they sext a partner simply because a channel makes it easier or more exciting than other channels. Ultimately, technology and interpersonal trust are intertwined throughout the sexting process. Though the two theories highlighted here have differing approaches to privacy, I believe they offer complementary insights that can build on each other.

Part of this is because a trustworthy partner can make choices to ensure a channel is more private. On the other hand, the same channels that may be perceived as safe or more protected can also be used by bad actors [53]. Thus, there are always going to be tensions between interpersonal and technological privacy [8]—though individuals may try to manage one of these, they often intersect. Even using a channel that feels like a guarantee for safety (such as Snapchat, with its disappearing content) can be used in ways that violate its original promise on behalf of a determined user. Taken together, it is likely that the most impactful theoretical and practical discoveries will thus come from understanding both CPM and privacy calculus as they manifest in sexting partnerships. CPM may inform the privacy calculus one engages in and vice versa. Considering privacy prior to disclosure as well as after is important in managing sexual content throughout a sexual interaction.

This also offers the opportunity to expand beyond specific channels to understand larger patterns of user behavior in sexting exchanges.

7. Theorizing and Understanding Sexting Outcomes

To this point, this article has considered the potential risks of sexting, focusing on invasions of privacy; I have also outlined how communication privacy management theory and privacy calculus may help in understanding risk-taking behaviors and risk-mitigating strategies for individuals who sext. Finally, I would like to consider how this theorizing may assist in better understanding the outcomes of sexting. As sexting can be a healthy practice for adults in particular, it is worth outlining how future research may embrace a sex-positive stance in considering these behaviors. Existing research indicates that individuals sext for reasons ranging from improved self-esteem to sexual desire and gratification [3,27]. Considering privacy, though, other outcomes may be considered.

First, interpersonal and technology trust may impact how individuals handle what happens when their sexual content is shared beyond intended audiences. Recent research suggests that adolescents who have had private sexual material shared without their permission may be less likely to turn to either adults or the legal system for help, instead managing the abuse within their own friend groups [54]. CPM components may be utilized to understand what helps an individual, especially adolescents, in turning to adults or the legal system for assistance when their material is shared. Though mitigation in one's friend group may feel productive [40], it may not have the long-term effects that involving an adult or authority figure could assist with. Understanding the initial rules or lack of rules when adolescents exchange sexual material could be enlightening in understanding who chooses to report image abuse or not. This could also extend to adult relationships, though the reporting may focus on different parties (such as a greater emphasis on legal involvement).

It is also likely that privacy perceptions will help to support and complement existing findings regarding how and why individuals sext and their positive relational outcomes from sexting. Though much research, including much of this article, focuses on sexting as a risk-taking behavior, it can be a positive experience for adults who sext in the context of committed relationships. Outcomes that may be probed, then, could include perceptions of privacy as they relate to sexting in the relationship generally (does it take place at all), comfort with the relationship, and trust in the relationship. It is important to not just consider sexting as a behavior that has no additional outcomes or implications; instead, understanding privacy and sexting could shed light on other relational practices and rituals.

Research into adolescents and sexting has already started incorporating elements of CPM to understand privacy practices, focusing on privacy management at the personal and interpersonal level [40]. This offers an example of how CPM both can shed light on sexting practices but also leaves room for further understanding the role of privacy calculus as well. For example, core criteria and catalyst criteria may relate to perceptions of calculus in sharing sexual content—this may be especially true in considering perceived positive outcomes compared to risks. An individual with core criteria around sex positivity, for instance, may ultimately perceive different outcomes in considering a sexting privacy calculus, compared to someone who is less sexually open.

Sexting will continue to be a rich area for future research, and the theories proposed here simply represent a start to better understanding the privacy perceptions in these interactions. Certainly, these are not the only theories that may help researchers to better understand why, how, and where individuals sext, and the privacy concerns they manage throughout. Networked privacy, with its emphasis on the visibility in SNS contexts and the lack of individual informational control [52], would certainly add insights to privacy and audience tensions alongside CPM and privacy calculus. However, CPM and privacy calculus offer a rich starting point for future research, particularly focusing on understanding the interactions between two parties. Further, other interpersonal communication theories, such as expectancy violations theory [55] will also be able to highlight concerns around

sexting and privacy. Expectancy violations will be crucial for understanding unsolicited sexual content, as well as understanding violations around unexpected sharing.

Finally, it is important to consider the practical outcomes from better understanding theories of privacy: individuals who sext may be able to better protect their own materials while also navigating the sometimes-difficult conversations around saving or sharing content. Recent work has suggested individuals often want to have these conversations but feel ill-equipped or nervous when the topic arises, even in established relationships [25]. Giving individuals the tools to better manage their content and communicate with their partners will lead to better sexting outcomes for many who participate.

I have argued throughout that sexting is a context for developing theoretical boundaries and extensions for both CPM and privacy calculus. However, applying these theories can also improve the sexting experience for many who engage in it. As researchers continue to consider sexting as a rich area for study, there is opportunity to not only learn but to also improve the experience for many. The outcomes and theories outlined here are just a start to further developing a rich body of work that aims to better understand sexting behaviors.

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