

# Embarrassing Exposures in Online Social Networks: An Integrated Perspective of Privacy Invasion and Relationship Bonding

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Online social networks greatly facilitate social exchange among friends. At times, for amusement, individuals may be targeted by friends' playful teases, which often involve exposing individuals' private embarrassing information, such as information that reveals their past indecent behavior, mischief, or clumsiness. Although individuals sometimes do enjoy the humor, they might also be offended by the involuntary exposure. Drawing on social exchange theory, this paper elucidates the consequences of an embarrassing exposure in online social networks. Specifically, this study examines the effects of information dissemination and network commonality on individuals' exchange assessment as well as how this assessment shapes their behavioral responses. The results of our experiment provide strong evidence that information dissemination and network commonality jointly influence individuals' perceived privacy invasion and perceived relationship bonding. In addition, whereas perceived privacy invasion increases transactional avoidance, it reduces approach behavior. Furthermore, whereas perceived relationship bonding impedes both transactional avoidance and interpersonal avoidance, it leads to approach behavior. The theoretical and practical implications of the findings are discussed.

*Keywords:* online social networks; embarrassing exposure; privacy invasion; relationship bonding; inaction; avoidance behavior; approach behavior

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## 1. Introduction

The use of online social networking websites, such as Facebook and Twitter, has increased dramatically since the mid-2000s. In online social networks, users seek to maintain and develop social relationships by creating profiles with information about themselves and connecting their profiles to those of others (Ellison et al. 2011). These connections facilitate the exchange of socially meaningful information (such as birthday wishes and jokes) and the sharing of common interests (such as arts and sports) (McLaughlin and Vitak 2012). At times, in the exchange of information, individuals' private embarrassing information may be involuntarily revealed by their friends, hence making the individuals targets of embarrassing exposure. For example, online social network users sometimes have a laugh at friends

by revealing their indecent behaviors and posting playful comments about them (Wang et al. 2011). The target might feel insulted as well as humiliated because their private information is involuntarily revealed (Kruger et al. 2006). Indeed, Madden (2012) reported that many online social network users were offended and often broke up profile connections in response to friends' revelations of their embarrassing information. Specifically, about two-thirds of the respondents deleted people from their friends' list, and more than one-third removed associations with the embarrassing content that were posted and tagged by friends. Such reactions do not only affect social exchange but also jeopardize the value of online social networking websites. As reported by Smith (2013), the market value of Facebook depends highly on the benign interactions of active

users; hence, decreased usage of social network may lead to tremendous financial loss to the site.

The traditional view of information privacy focuses on privacy issues associated with voluntary revelations (e.g., Culnan 1993, Smith et al. 1996). Yet a contemporary view of information privacy emphasizes that the impact of privacy issues might be better understood by considering *involuntary exposures* (Petronio 2002, Solove 2006). Increasing evidence highlights the prevalence of involuntary exposures in the online environment. For instance, Lenhart (2008) reported that 32% of Internet users had experienced privacy invasions through some form of involuntary exposure, such as having private materials unwillingly distributed or being involuntarily tagged in embarrassing pictures. Furthermore, past privacy research has mostly focused on explicating privacy issues associated with the disclosure of information that may have tangible consequences for affected individuals, such as social security numbers, financial information, and transaction information. Although the divulgence of such information often aggravates privacy concerns, the exposure of such information is less common, if not atypical, in online social networks (Madden et al. 2013). In fact, evidence shows that exposure of private embarrassing information, which generally does not cause direct tangible damage to individuals but might affect their social status and relationships with others (e.g., Kowalski 2000), constitute the main source of threat to individuals' privacy in online social networks (Madden and Smith 2010). Hence, *our first objective is to study involuntary exposures of embarrassing information in online social networks*, which, surprisingly, has not attracted much attention from information systems (IS) researchers.

Past research suggests that a social exchange commences when individuals' private embarrassing information is involuntarily exposed to others. Schnurr and Chan (2011), for instance, noted that one's embarrassing information was often exchanged as gossips and playful provocations in organizational settings. Accordingly, we draw on social exchange theory as the overarching framework to identify the key aspects of online involuntary exposures. This theory posits that an individual assesses a social exchange with reference to two important aspects of the exchange, namely, (1) *exchange behavior* (i.e., the way the social exchange is conducted) and (2) *social relationship structure* (i.e., the structure of relationships between individuals involved in the social exchange; Emerson 1972a, b). Correspondingly, this paper investigates two specific aspects of online embarrassing exposures, i.e., the way embarrassing information is involuntarily disseminated in online social networks and the extent to which the social network of the disseminator overlaps with that of the target.

The assessment of privacy cost and benefit has been the focus of attention in prior IS studies examining privacy issues in online exchange (e.g., Choi et al. 2015, Dinev and Hart 2006). Most of these studies have been conducted in the context of *online commercial transactions* (e.g., Sutanto et al. 2013, Tam et al. 2015) and have found that individuals typically evaluate privacy cost against some tangible benefits in online exchange, such as discounts, rebates, and services. Nevertheless, these benefits may not be applicable to *online social networks*, a context different from that of online commercial transactions. Hence, *the second objective of this study is to elucidate the specific privacy cost and benefit that individuals evaluate in an involuntary embarrassing exposure*. To this end, this study integrates past privacy research and the teasing literature to investigate a target's cost and benefit perceptions related to an embarrassing exposure in online social networks. In terms of cost assessment, we rely on extant privacy research to explain the way an involuntary exposure intrudes the target's privacy. In terms of benefit assessment, we rely on the teasing literature to understand the impact of an embarrassing exposure on social relationship development between the disseminator and the target. Indeed, the teasing literature suggests that individuals often enhance interpersonal affinity by publicizing friends' mischief on online social networks and expressing mock disappointment at their embarrassing behavior (e.g., Wang et al. 2011). Those who have become the target of an unsolicited embarrassing exposure sometimes do enjoy the humor and feel a strong sense of attachment with their friends (Lange 2007).

Finally, extant information privacy studies have demonstrated that individuals take on multiple reactions to information requests, such as complaints and negative word of mouth (e.g., Son and Kim 2008). More recent studies examining information privacy have revealed that individuals' privacy assessment substantially influences their own disclosure to satisfy others' information request in online exchange (e.g., Jiang et al. 2013). Overall, despite shedding light on individuals' reactions to information request, the extant privacy literature offers little insight into individuals' reactions when their embarrassing information is involuntarily disclosed by others. Thus, *our third objective is to investigate the target's behavioral responses to an online embarrassing exposure*. Specifically, this study proposes and empirically tests a classification of behavioral responses when individuals' embarrassing private information is revealed by others without permission.

Overall, this study aims to offer new insights into online involuntary embarrassing exposures by integrating the privacy literature and teasing literature under the social exchange framework. Additionally, by synthesizing past research examining response behavior, we intend to classify and establish different types

of behavioral responses to embarrassing exposures in online social networks.

The remainder of this paper is organized as follows. Section 2 reviews previous literature and discusses the theoretical foundation for this study. The research model and hypotheses are then proposed in §3, followed by the introduction of the research methodology, in §4, and the report of the data analysis results in §5. This paper concludes with the discussion of theoretical and practical contributions, limitations, and avenues for future research in §6.

## 2. Literature Review

In this section, we develop our theoretical perspective on online embarrassing exposures. We begin by reviewing social exchange theory, which serves as the overarching framework of our research model. We then turn to extant privacy research and the literature on teasing to understand individuals' social exchange cost and benefit associated with embarrassing exposures. Finally, we review extant research in exchange response behaviors to explore how individuals respond to online embarrassing exposures.

### 2.1. Social Exchange Theory

A social exchange is a social interaction (or joint activity) in which two or more individuals are engaged in activities directed toward one another (Homans 1958). According to social exchange theory, the process of a social exchange between two individuals begins when one of them makes a "move" that provides inputs into the relationship (Cropanzano and Mitchell 2005). The other individual's subsequent response behavior in the social exchange is driven by her overall evaluation of the input (Blau 1964). Depending on the recipient's exchange assessment, positive inputs are typically met with positive responses, whereas negative inputs are reciprocated with negative responses. Although different views of social exchange have emerged, theorists agree that the behavior of the other party in a social exchange and the relationship structure in which the social exchange occurs are important considerations in an individual's assessment of the social exchange. Indeed Emerson (1972a, b), in his seminal works on social exchange theory, considers social behavior and social structures as the central subject matters in shaping social interactions. Specifically, Emerson (1972a, b) posits that the assessment of a social exchange is jointly determined by the behavioral attribute of an exchange and the structural attribute of exchange networks. In the following sections, these two key components of social exchange theory are discussed.

**2.1.1. Exchange Behavior.** Within the social exchange framework of Emerson (1972a, b), an actor initiates the social exchange through *exchange behavior*,

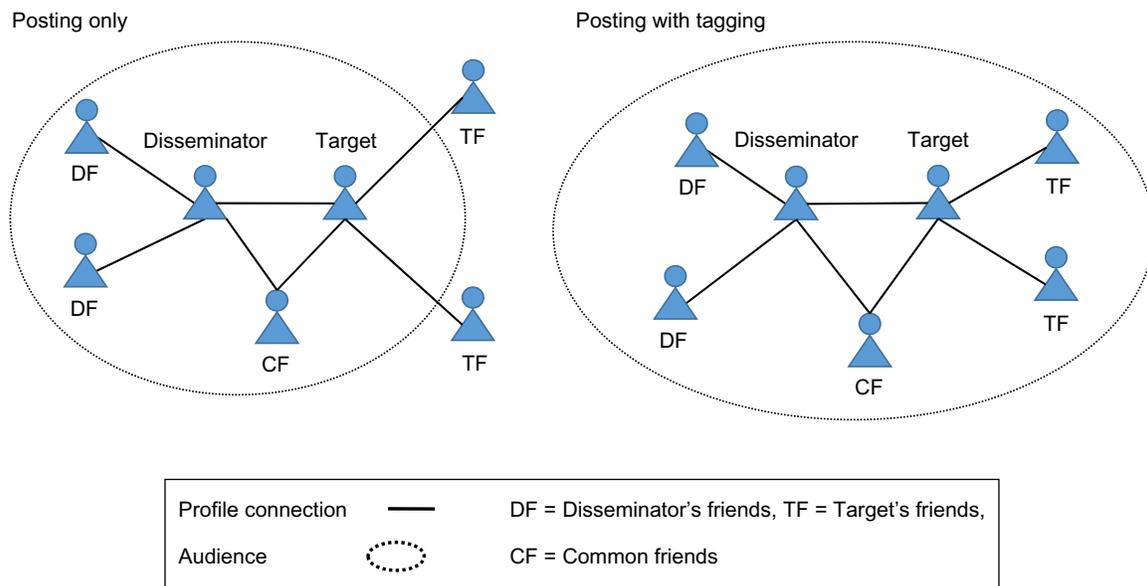
which describes communication actions performed by individuals in a social exchange process (Cook and Whitmeyer 1992). Indeed, scholars have categorically pointed out the importance of exchange behavior in people's interpretation of social exchange (e.g., Molm et al. 2003).

Consistent with the social exchange framework, embarrassment can occur when embarrassing information is involuntarily disseminated through others' communication behavior (Alberts et al. 1996). This study focuses on two types of widely adopted exchange behavior that can be performed by the information disseminator in online social networks (Greenhow and Robelia 2009): posting only and posting with tagging. *Posting only* is an information dissemination mechanism in which a disseminator publishes content (about a target) on her own profile. When posting only is performed, the content is exposed to an audience within the disseminator's social network and cannot be seen by the target's friends. Furthermore, posting only does not trigger a system-generated notification that alerts the target about the dissemination. Hence, the target is not prompted to actively engage in the social interactions triggered by the embarrassing exposure.

By contrast, *posting with tagging* is a dissemination mechanism that not only exposes the content to the disseminator's social network but also disseminates it to the social network of the target. When posting with tagging is performed, a hyperlink labeled by the target's profile name is established. This hyperlink facilitates traceability between the content and the target, thus contributing to *target individuation*, which is a state in which individuals are being singled out in the content (Maslach et al. 1985). Posting with tagging also triggers a system-generated notification that informs the target about the dissemination (Ma 2013). This notification makes the exposure clearly known to the target and is vital in prompting *target participation*, i.e., the target's active involvement in social interactions triggered by the embarrassing exposure. Table 1 and Figure 1 summarize the key differences between posting only and posting with tagging in terms of the audience, target individuation, and target participation.

**Table 1** Key Difference Between Posting Only and Posting with Tagging

	Audience	Target individuation	Target participation
Posting only	The disseminator's social network	Target's identity revealed within content	Absent, due to lack of target notification
Posting with tagging	The social networks of the disseminator and the target	Target's identity revealed within content and singled out via profile traceability	Present, enabled by target notification

**Figure 1** (Color online) Audience Difference Between Posting Only and Posting with Tagging

**2.1.2. Social Relationship Structure.** Social exchange theorists have unambiguously conceptualized social relationship structure as a configuration of network relations (i.e., as a set of actors diversely linked in a social network) where information is exchanged among actors. Although social relationship structure might be explicated in several forms, ample empirical studies have demonstrated the importance of common social networks in social exchange (e.g., Choi and Jiang 2012). For example, Grosser et al. (2010) examined the effects of network structures on gossiping behavior and found that the number of mutual friends played a key role in shaping the meaning of gossiping behavior in social networks.

This study uses *network commonality* to characterize the social relationship structure through which an information disseminator and a target are connected. Network commonality, defined as the degree of network overlap, often manifests in the number of common friends shared by two individuals. High network commonality typifies tightly bounded relationships between two individuals who share essentially common social circles. By contrast, low network commonality characterizes sparsely knit relationship structures, in which individuals have largely independent social circles. In involuntary embarrassing exposures, network commonality affects the size and type of the audience. High network commonality suggests that the size of the audience can be largely determined by the number of common friends and that the majority of the audience is known to the target. However, in the case of low network commonality, the size and type of the audience can vary substantially, depending on the way the embarrassing information is disseminated. When the exposure is disseminated via posting only,

the size of the audience is equivalent to the number of the disseminator's social network connections and the majority of the audience is unknown to the target. When the exposure is disseminated via posting with tagging, audience size is the sum of the social network connections of the disseminator and the target, and the audience consists of those both known and unknown to the target.

## 2.2. Social Exchange and Privacy

Although IS research has enriched our understanding of exchange assessment, past research has focused predominantly on examining privacy issues in online commercial transactions (e.g., Sutanto et al. 2013), with only a few studies investigating privacy problems (such as identity theft and stalking) in online social networks (e.g., Lewis et al. 2008, Choi and Jiang 2013a). Evidence suggests that when individuals' embarrassing information is exposed involuntarily in a social network, individuals' perception of privacy invasion becomes particularly aggravated (e.g., Debatin et al. 2009). In this study, we examine *perceived privacy invasion*, which refers to the extent to which an individual believes that her personal information space is intruded by others (Tolchinsky et al. 1981), as the major cost individuals experience in an involuntary embarrassing exposure.

Past literature suggests that the extent of privacy invasion individuals experience can be explained and predicted by two important mechanisms, namely, *target individuation* and *audience size* (e.g., Altman et al. 1981). Whereas a high level of target individuation connotes explicit identification of individuals and hence elevating individuals' perception of privacy invasion, a low level of target individuation represents submergence of identity information within an exposure and is known

to limit individuals' perception of privacy invasion (Postmes and Spears 1998).

Audience size refers to the number of recipients in a privacy exposure incident (Acquisti and Gross 2006). Empirical evidence has substantiated the role of audience size in affecting privacy invasion. For example, Petronio (2002) found that when individuals' embarrassing information was discussed among a limited number of interactants, such discussions were typically seen as a small-size exposure in which the embarrassing conversation was contained within the few interactants. The author noted that the effect of individuation on privacy invasion would diminish when the audience size was small. However, when the size of the audience escalated beyond a limited number of interactants, the discussions were seen as a large-size exposure. As a result, the role of individuation in elevating individuals' perception of privacy invasion was amplified.

In summary, based on past privacy research, target individuation and audience size are two key influences on individuals' perception of privacy invasion, which is regarded as the main cost in an involuntary exposure of embarrassing information.

### 2.3. Social Exchange and Teasing

Teasing is a form of social exchange in which individuals are targeted in playful provocations, such as humorous remarks and sarcasm (Keltner et al. 2001). Although the manner in which teasing might be carried out varies, prior research shows that people do make fun of each other by revealing their embarrassing information without seeking permission a priori (e.g., Lampert and Ervin-Tripp 2006). Involuntary embarrassing exposure is paradoxical (i.e., it humiliates yet expresses affection, attacks yet draws people closer) and hence is frequently utilized among friends (Keltner et al. 1998). Researchers suggest that teasing is typically evaluated in terms of the relationship bonding perceived by the target (Campos et al. 2007). Accordingly, we examine perceived relationship bonding, which refers to the extent to which an individual believes that an interaction leads to an improved social relationship (Beatty et al. 1996), as a major benefit the target derives from an involuntary exposure of embarrassing information.

The teasing literature suggests that the effect of teasing on relationship bonding depends on the *type of audience* involved (Jones et al. 2005). For instance, Alberts et al. (1996) asserted that audience type influenced individuals' perceptions of embarrassing conversations they had in social interactions. Specifically, when the audience was made up of friends, individuals perceived the embarrassing interaction targeted at them as an indication of affiliation. However, when the embarrassing information was exposed mainly to

unknown strangers, individuals considered the targeted exposure as direct humiliation.

Research on teasing also theorizes that individuals' perception of relationship bonding in a teasing interaction can be further moderated by *target participation*, which allows the target to take part in a teasing interaction (Keltner et al. 1998). On one hand, while teasing among friends can be considered a positive bonding experience (Campos et al. 2007), the degree of positivity depends on whether the target is explicitly involved. If the target is properly informed of and involved in a tease, the target may emphasize the humorous nature of the tease and deem it an unequivocal expression of friendship. Otherwise, if the target is not involved in a tease, teasing could be seen as gossip spread behind one's back, and thus its impact on positive bonding experience may be diluted (Kowalski 2001). On the other hand, whereas teasing is generally considered negative among strangers, its effect will become even stronger when the target is explicitly involved. In this case, the target might even see such communication as deliberate humiliation directed at her (Keltner et al. 1998).

In essence, the teasing literature suggests that relationship bonding is an important benefit individuals could experience in an involuntary exposure of embarrassing information, and that the experience of relationship bonding could be influenced by both audience type and target participation.

### 2.4. Social Exchange and Response Behavior

Social exchange theory contends that individuals' assessment of cost and benefit determines their behavioral responses (Cook and Whitmeyer 1992). Kuhl (1981) classified response behaviors into a dichotomy of *passive* and *active* behaviors. Passive behavior reflects inertia to act in response to social exchange. It is essentially an inaction strategy, which maintains a static orientation in social exchange through ignorance, negligence, or procrastination (Rusbult and Martz 1995). On the contrary, active behavior encompasses both *avoidance* and *approach* strategies in response to social exchange. Individuals are typically motivated to avoid costs and approach benefits in social exchange. As Liang and Xue (2009) indicated, the avoidance and approach strategies are driven by independent psychological processes and hence can be performed concurrently. Whereas the avoidance strategy is about shunning away from interactions and keeping a distance from others, the approach strategy is "to go to, head for, or strive after" others in social exchange (Marsh et al. 2005, p. 119).

Inasmuch as the objective of avoidance is to dissociate from an undesirable outcome (Choi and Jiang 2013b), past research suggests that the avoidance strategy might manifest in different forms (e.g., Ross et al. 2009). To respond to embarrassing exposures, the *avoidance* strategy can be exercised at the transactional level

and the interpersonal level (Ting-Toomey and Oetzel 2001). At the transactional level, individuals engage in avoidance by excusing themselves from an interaction. At the interpersonal level, avoidance strategy is performed in terms of relationship severance. The objective of the *approach* strategy, by contrast, is to maintain, if not enhance, a desirable outcome in social exchange (Ross et al. 2009). To respond to embarrassing exposures, the approach strategy is typically performed through individuals' pursuit of further interaction (Alberts et al. 1996).

It is important to note that although avoidance and approach behavior appear to be antagonistic and non-coexistent, a closer examination suggests that under certain circumstances, e.g., when social environments allow segregated communication channels, individuals indeed perform both avoidance and approach concurrently (e.g., Oetzel et al. 2008). For example, in response to an uncomfortable provocation, individuals may demonstrate a friendly approach reaction to calm the conflict in a public setting to maintain one's social image, but can express outright hostility to the provocateur in a private setting.

### 3. Research Model and Hypothesis Development

The research model employs social exchange theory as the overarching framework to explain the consequences of an involuntary embarrassing exposure in online social networks (see Figure 2). Specifically, this study examines two types of *information dissemination*, i.e., posting only and posting with tagging. Additionally, to elucidate the role of social relationship structure in an online embarrassing exposure, this study examines two types of *network commonality* between the disseminator and the target, i.e., low network commonality versus

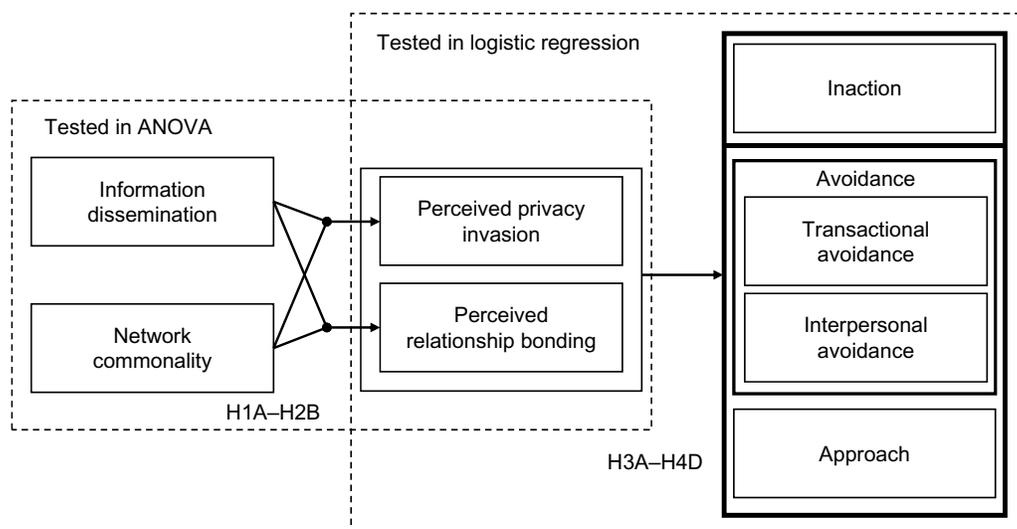
high network commonality. The effects of these two independent variables on individuals' assessment of social exchange are investigated in terms of *perceived privacy invasion* and *perceived relationship bonding*. Furthermore, we assess the effects of these two perceptions on individuals' behavioral responses.

#### 3.1. Determinants of Perceived Privacy Invasion

Target individuation is known to exacerbate individuals' perception of privacy invasion in involuntary exposures (Altman et al. 1981). Specifically, when the target remains largely unidentifiable in an exposure, she becomes deindividuated and hence is not worried about privacy (Qian and Scott 2007). On the contrary, when the identity of the target is made explicit, she is likely to become highly individuated and concerned with privacy invasion. In online social networks, the disseminator may disseminate embarrassing information through posting only or posting with tagging. When posting only is performed, the embarrassing information is disseminated without establishing profile traceability between the content and target. As a result, target individuation is likely to become less apparent. By contrast, posting with tagging explicates target individuation by establishing a hyperlink that makes the embarrassing information traceable to the target's profile. Therefore, compared with posting only, posting with tagging enhances target individuation in the involuntary embarrassing exposure, and hence elevating the target's perception of privacy invasion. Thus, we posit the following:

**HYPOTHESIS 1A (H1A).** *Compared with posting only, posting with tagging will lead to a higher level of perceived privacy invasion.*

Figure 2 Research Model



Past privacy research suggests that the effect of target individuation on perceived privacy invasion is moderated by network commonality (e.g., Petronio 2002). In cases of low network commonality, the target's social network is mostly distinct from that of the disseminator. As such, when the embarrassing information is posted only, the target is likely to conclude that the audience size is limited to the disseminator's social network because the target's friends (except those in common with the disseminator) cannot view the posted content (Postmes and Spears 1998). Posting with tagging, however, leads to an enlarged overall size of the audience compared to posting only, because the embarrassing information is also exposed to the social network of the target. Therefore, when network commonality is low, the enlargement of exposure size enabled by posting with tagging will significantly enhance the target's perception of privacy invasion.

By contrast, when network commonality is high, the target's social network is highly convergent with that of the disseminator. Accordingly, posting with tagging is not likely to contribute to a significant gain in overall audience size compared to posting only. Therefore, when network commonality is high, the increase in the target's perception of privacy invasion associated with posting with tagging will not be as marked as when network commonality is low. We thus hypothesize the following:

**HYPOTHESIS 1B (H1B).** *The effect of information dissemination on perceived privacy invasion is stronger in the low network commonality condition than in the high network commonality condition.*

### 3.2. Determinants of Perceived Relationship Bonding

The teasing literature suggests that in a teasing interaction, the type of participants in an embarrassing exposure influences the impact of a target's presence on the relationship between the teaser and the target. (e.g., Alberts et al. 1996). In particular, when the participants are friends of the target, the target's presence in the interaction helps emphasize the humorous aspect of the exposure and hence enhances rapport between the target and the teaser. On the contrary, when the participants are strangers to the target, the target's presence underscores the humiliating aspect of the exposure and hence damages the relationship between the two.

In online social networks, as mentioned earlier, network commonality determines the types of audience in an involuntary exposure of embarrassing information. In cases of low network commonality, the target's social network and the disseminator's social network are largely distinct. Therefore, friends of the disseminator, who are likely unknown to the target, form a substantial part of the audience regardless of the presence

or absence of tags. This unacquainted audience type induces prudence in the target's interpretation of the way in which the embarrassing information is disseminated (Tedeschi 2001). In particular, when the embarrassing information is posted with tagging, the target is unequivocally singled out and made the subject of a mockery in front of an unacquainted audience; hence, the target might interpret the embarrassing exposure as a direct humiliation (Kotthoff 2003). Moreover, posting with tagging triggers a notification that alerts the target about the dissemination. This notification forces the target to participate in the exposure, hence she is likely to be affronted by the dissemination. Overall, in cases of low network commonality, posting with tagging is often interpreted as humiliation and mockery, which might degrade relationship bonding. Posting only, however, disseminates the embarrassing information without target notification. Consequently, the target would not be forced to participate in the exposure and hence she might not be seriously offended by the embarrassing exposure to an unacquainted audience. In essence, when network commonality is low, posting with tagging constitutes a direct humiliation and hence will lead to a lower perception of relationship bonding compared to posting only.

On the contrary, when network commonality is high, the social network of the target is highly similar to that of the disseminator. As a result, the audience of the embarrassing exposure consists mainly of the target's and disseminator's mutual friends. This acquainted audience prompts the target to emphasize the positive impact of target participation when interpreting the teasing interaction (Boxer and Cortés-Conde 1997). In particular, posting with tagging explicitly notifies the target about the embarrassing exposure, an act that ensures target participation in the teasing interactions among friends, which underscores the embarrassing exposure as an unequivocal humor (Keltner et al. 2001). By contrast, in the absence of target participation, as in the case of posting only, the target is not explicitly invited to participate in the teasing interaction with friends. Consequently, the target might deem the embarrassing exposure a less pleasant gossip behind her back. Therefore, in the high network commonality condition, posting with tagging connotes stronger interpersonal affiliation and hence reinforces the perception of relationship bonding between the disseminator and the target compared to posting only. Thus, we predict the following effects:

**HYPOTHESIS 2A (H2A).** *In the low network commonality condition, compared with posting only, posting with tagging will lead to a lower level of perceived relationship bonding.*

**HYPOTHESIS 2B (H2B).** *In the high network commonality condition, compared with posting only, posting with*

tagging will lead to a higher level of perceived relationship bonding.

### 3.3. Behavioral Responses

Based on the past studies that are discussed in §2, we propose four types of behavioral responses to an embarrassing exposure, namely, *inaction*, *transactional avoidance*, *interpersonal avoidance*, and *approach*. First, *inaction* refers to the target's assumption of indolence in an embarrassing exposure. By taking no action, individuals demonstrate their apathy and disinterest regarding the exposure. Second, *transactional avoidance* refers to the activity in which the target actively dissociates herself from the embarrassing information. In online social networks, through transactional avoidance, individuals aim to stop the embarrassing information from being further disseminated. Third, *interpersonal avoidance* is defined as the activity in which the target actively terminates her relationship with the disseminator. Individuals typically dissociate themselves from unsatisfactory relationships but enhance their relational associations with decent others. Last, *approach* refers to the activity in which the target actively engages in the social interactions to further advance relationship development. Whereas *transactional avoidance* and *interpersonal avoidance* focus on detachment and dissociation that hinder further social exchange, *approach* considers the target's involvement behavior that completes a social exchange. Furthermore, inaction is exclusive of other behavioral responses, but transactional avoidance, interpersonal avoidance, and approach are multiplex responses that can be performed concurrently.

**3.3.1. Perceived Privacy Invasion and Behavioral Responses.** Invasion of privacy exposes the target to ridicule and defamation in a social exchange (Abril 2007). Taking no action against the involuntary exposure of her embarrassing information (by keeping silent or ignoring the exposure) will not only sustain the privacy invasion but also express the target's tolerance toward privacy invasion. Hence, perception of privacy invasion provides strong reasons for the target to resign from inaction.

According to Liang and Xue (2009), avoidance behavior is instigated when individuals are close to threats and motivated to keep a distance from the threats. In the case of embarrassing exposures, a target who perceives high privacy invasion is likely to believe that the involuntary exposure has fundamentally threatened her private space in online social networks. To reestablish the privacy space, the target may actively engage transactional avoidance to distance herself from the embarrassing exposure. Additionally, a target who perceives high privacy invasion may actively engage in interpersonal avoidance through relationship dissolution (Petronio 2002). By withdrawing affiliation with

the disseminator, the target avoids subjecting herself to further privacy invasion.

Approach behavior does not only draw the target toward the embarrassing exposure but also makes her vulnerable to further privacy invasion (Drew 1987). When the target engages in approach behavior, the disseminator can be instigated by the target's active involvement and hence engage in further embarrassing exposures. Therefore, perceived privacy invasion is expected to reduce approach behavior.

In sum, we posit the following:

**HYPOTHESIS 3A (H3A).** *Perceived privacy invasion will reduce the likelihood of inaction.*

**HYPOTHESIS 3B (H3B).** *Perceived privacy invasion will increase the likelihood of transactional avoidance.*

**HYPOTHESIS 3C (H3C).** *Perceived privacy invasion will increase the likelihood of interpersonal avoidance.*

**HYPOTHESIS 3D (H3D).** *Perceived privacy invasion will reduce the likelihood of approach behavior.*

**3.3.2. Perceived Relationship Bonding and Behavioral Responses.** According to the social exchange framework, individuals' emotional attachment to others induces obligation to offer others socioemotional resources, such as approval, respect, and support (Eisenberger et al. 2001). Hence, when a target perceives strong relationship bonding, the target is likely to feel obligated to act up to her relational role by devoting increased socioemotional resources to the disseminator. Therefore, the target who perceives relationship bonding will be less likely to assume inaction.

Past research suggests that perception of relationship bonding impedes avoidance behavior (Campos et al. 2007). Specifically, because transactional avoidance interrupts social communications, its enactment may bring an abrupt end to an affiliating interaction. Hence, the target who perceives relationship bonding is likely to continue her association with the dissemination and/or be reluctant to dispute the exposure. Furthermore, perceived relationship bonding represents increased emotional and cognitive attachment between the target and the disseminator. The elevated level of emotional and cognitive attachment induces additional motivations for the target to assume a long-term orientation in the relationship (Agnew et al. 1998). Therefore, when the target perceives higher relationship bonding, she will be more eager to remain in the relationship and less willing to engage in interpersonal avoidance.

Approach behavior is an important behavioral response to the relationship bonding derived from a social exchange. For example, Tidwell and Walther (2002) examined social exchange in computer-mediated communication and found that individuals responded to socially meaningful interactions by sustaining interaction involvement, such as providing prompt responses,

engaging in deep self-discloses, and asking personal questions. In a study examining interpersonal teasing, Boxer and Cortés-Conde (1997) revealed that relationship bonding derived from teasing prompted interlocutors to maintain the interaction by giving more prompt responses to each other. Approach behavior can also be understood as feedback in social exchange, in which the target acknowledges the social exchange initiated by the disseminator (Lawler and Thye 1999). Consequently, a target with a strong perception of relationship bonding will increase approach behavior in response to an embarrassing exposure.

In sum, we posit the following:

**HYPOTHESIS 4A (H4A).** *Perceived relationship bonding will reduce the likelihood of inaction.*

**HYPOTHESIS 4B (H4B).** *Perceived relationship bonding will reduce the likelihood of transactional avoidance.*

**HYPOTHESIS 4C (H4C).** *Perceived relationship bonding will reduce the likelihood of interpersonal avoidance.*

**HYPOTHESIS 4D (H4D).** *Perceived relationship bonding will increase the likelihood of approach behavior.*

## 4. Research Method

Facebook was chosen as the online social network platform for the present study for two reasons: (1) it provides functionalities such as information posting as well as content tagging, and thus is a suitable platform for information dissemination; (2) it is widely used, and thus findings from the present study may have greater generalizability to the general online social network user population.

### 4.1. Experimental Design

A laboratory experiment with a 2 (*information dissemination*, posting only versus posting with tagging)  $\times$  2 (*network commonality*, low versus high) factorial design was conducted to test the proposed hypotheses. Information dissemination was manipulated by the exclusion and inclusion of tagging on a note published on the disseminator's profile. Network commonality was facilitated by manipulating the number of shared friends the target has in common with the disseminator. Evidence suggests that an average Facebook user has 130 friends in their friend list, and the average number of mutual friends shared by two Facebook friends is 35 (Eldon 2010). Accordingly, in our manipulation, we used 7 shared friends, which is about 5% of the average number of friends a user has, to represent low network commonality, and 65 shared friends, which is about 50% of the average number of friends per user, to represent high network commonality. Our experiment involved a simulation of an online embarrassing exposure using a hypothetical scenario (Brass and Burkhardt 1993). Hypothetical scenarios have been used in previous

IS and privacy research (e.g., Anderson and Agarwal 2011), and this method is particularly valid for this study for three important reasons. First, social networks are highly personal, so it is difficult to create such an artificial environment in a laboratory that resembles users' actual social networks experience. Second, although a field experiment might better mimic an actual situation, it is not possible to administrate the experimental conditions that involve credible embarrassing treatments without impairing the realism of the treatments. As a result, subjects' true perceptions and responses might be undermined. Last, if a survey was used, it would not be practical for subjects to report their responses toward an embarrassing exposure. This is because some of them might not have experienced such embarrassment in online social networks, and even if some had, it would be extremely challenging, if not impossible, for them to vividly recall the entire incident to respond to survey questions. Furthermore, by using a survey, it would be impossible to ensure consistency in terms of the nature and valence of the recalled embarrassing exposures.

A pilot test with 20 subjects was conducted prior to the main experiment to assess the appropriateness of the experimental stimulus (i.e., the note publication scenario that exposes an embarrassing incident). Subjects were instructed to go through five incidents (i.e., shopping for condoms, purchasing disposable underwear, kissing on the subway, reading adult magazine, and sleeping in lecture), which were typical embarrassing situations occurring in public settings and observable by others (Dahl et al. 2001, Sabini et al. 2001). They were asked to imagine that each of the incidents was published in a Facebook note and then rated on the perceived *embarrassment*<sup>1</sup> caused by the note and judge the extent to which each incident was *relevant*<sup>2</sup> to people like themselves (Table 2). Results showed that all five scenarios were embarrassing (mean, 6.08). No significant differences were found among the scenarios with respect to perceived embarrassment ( $F(4, 95) = 1.45$ ,  $p = 0.22$ ).

In addition, the exposure scenario depicting the subjects sleeping in a lecture theatre (i.e., the note, see

<sup>1</sup> Perceived embarrassment represents the extent to which a person is uncomfortable about the note publication. It was measured by three seven-point Likert scale items based on Sabini et al. (2000): "The note publication makes me embarrassed," "The note publication makes me feel awkward," and "The note publication makes me feel uncomfortable."

<sup>2</sup> Perceived relevance represents the extent to which a person believes that the embarrassing incident is relevant to her real life experience. It was measured by three seven-point Likert scale items based on Zaichkowsky (1985): "The incident discussed in the note is important to people like myself," "The incident discussed in the note matters to people like myself," and "The incident discussed in the note is significant to people like myself."

**Table 2** Means of the Five Scenarios

Incident	Perceived embarrassment		Perceived relevance	
	M	SD	M	SD
A	6.23	0.68	3.54	0.73
B	5.80	0.96	4.29	0.77
C	5.95	0.71	4.35	0.49
D	6.15	0.69	2.13	0.75
E	6.28	0.69	6.03	0.73

*Notes.* A, Shopping for condoms; B, purchasing disposable underwear; C, kissing on the subway; D, reading adult magazine; E, sleeping in lecture; M, mean.

**Table 3** Embarrassing Scenario

Note title: Caught sleeping in lecture

Note content: I was sitting somewhere in the middle of the lecture theatre just now. After about 30 minutes of lecture, I started to feel really tired and begun stretching my neck. While turning my head around for the stretch, I somehow realized [subject's nickname] was also in the LT!<sup>a</sup> I was thinking that he/she was also doing some neck stretches, but I was wrong! I realized he/she was actually falling asleep and jerking his/her head left and right. Besides jerking his/her head around, he/she was dripping saliva from his/her mouth! Then out of a sudden, he/she banged his/her head onto the desk! It was a really hard hit and the whole LT was shocked by the BANG sound! I am sure it wakes you up for the rest of the lecture yeah? Lolx :p

*Note.* The embarrassing scenario was customized for each subject by reflecting his or her nickname (or the name typically known by his or her friends) and gender, which were obtained prior to the experiment.

<sup>a</sup>LT is the abbreviation of lecture theatre.

Table 3) was rated by the subjects as the most relevant (mean, 6.03); hence it was selected as the stimulus for this study.

#### 4.2. Sample and Experimental Procedures

Subjects in this experiment were students at a large public university in Southeast Asia. Prior to the experiment, subjects were asked to provide information about demographics, Internet experience, Facebook experience, Facebook usage intensity, dispositional privacy concerns, sociability, and their names commonly known by their friends. One week before the experiment, subjects attended an online Facebook training on several key technical features, such as posting, tagging, and social browsing. After completing the training, subjects were given an online quiz of 20 multiple choice questions to assess their understanding of the technology features. On average, subjects provided 18 correct answers. These results show that the subjects had a concrete understanding of the key technical features (i.e., posting and tagging).

Subjects were also instructed to send friend requests to a research Facebook account. Subjects were informed that their profile information would be collected for the purpose of this study. One day before the experiment, the research account was used to capture the profile

**Table 4** Experimental Conditions

	Low network commonality	High network commonality
Posting only	<i>N</i> = 27	<i>N</i> = 28
Posting with tagging	<i>N</i> = 28	<i>N</i> = 26

information of each subject. The captured information included the subject's profile page, wall postings for the past three months, photo albums, and the note section. All subjects were found to have experience in being tagged in contents posted by others. Furthermore, they were found to have used Facebook actively for the past three months.

Following the empirical results of past studies (e.g., Zakriski et al. 2005), 109 subjects, who did not take part in the pilot study, were recruited to participate in the experiment to ensure sufficient power (0.8) with a medium to high effect size ( $f = 0.30$ )<sup>3</sup> for both the main effects and the interaction effects.

Subjects were randomly assigned to one of the four experimental conditions (Table 4) in a mock-up Facebook environment that mimicked an actual Facebook layout and technology features (e.g., sponsored advertisements and comment) as well as customized with the subjects' actual Facebook profile information (i.e., profile names and profile pictures). They were presented with a hypothetical scenario in which an imaginary friend (i.e., denoted by the name "X" and a unisex avatar), who shared 7 mutual Facebook friends (or 65 mutual Facebook friends; see §4.1), posted (and tagged them to) a note in the mock-up environment. To ensure realism, the note was personalized with subjects' genders and names commonly known by others. Subjects were told to imagine that the scenario was real and read through it carefully. Afterward, subjects were instructed to complete a questionnaire that contained manipulation checks and measurement items of the research variables. Subsequently, they were given the option to respond (or not to respond) to the note published in the mock-up environment (see Figure 3). On completing their responses in the mock-up environment, subjects were debriefed and thanked.

<sup>3</sup> The effect size reported in past studies is quite large. For example, in a study examining peer teasing, Zakriski et al. (2005) reported an effect size of 0.37. Similarly, Sueda and Wiseman (1992) examined behavioral responses to embarrassment episodes and reported an effect size of 0.32. In a meta-analysis, Menzel et al. (2010) examined the relationship between teasing and self-perceptions and found a weighted mean effect size of 0.32. Therefore, following the empirical results of past research, we have assumed a medium to large effect size ( $f = 0.30$ ) for both the main effects and the interaction effects in estimating the sample size.

Figure 3 (Color online) Mock-Up Facebook Environment



Notes. (a) 1, No response; 2, send a private peer-to-peer message; 3, mark the note as spam; 4, share; 5, post a public comment; 6, give a “Like” to the note; 7, report the note to Facebook; 8, remove the disseminator as a Facebook friend; 9, report the disseminator to Facebook; A, note content. Subjects might perform any of the eight active responses (2 to 9). All eight active responses might be performed should the subject desire. Those who chose no response (1) were immediately redirected to a thank you screen. (b) Due to trademark restrictions, the logo is blurred here.

## 5. Data Analysis

### 5.1. Subject Demographics and Background Analysis

Among the 109 subjects, 52 were female. The age of the subjects ranged from 18 to 25, with the average Internet experience and average Facebook experience being 7.3 years and 3.7 years, respectively. The average time a subject spent on completing the entire experiment was 30.4 minutes.

No significant differences were found among subjects randomly assigned to each of the four experimental conditions with respect to age, gender, Internet experience, and Facebook experience, indicating that subjects’ demographics were quite homogeneous across different conditions.

### 5.2. Measurement

The manipulation check for *information dissemination* was performed by asking subjects three true/false questions on whether the information was disseminated with tagging (see the appendix for manipulation

check items). All subjects in the posting only condition answered “false” to the three questions, and all those in the posting with tagging condition answered “true,” hence suggesting that the manipulation for information dissemination was successful. The manipulation check for *network commonality* was conducted by asking subjects to rate on four items, measuring the extent to which their social networks overlapped with those of the disseminator. On a seven-point Likert scale, subjects in the low network commonality condition reported a mean value of 2.57 for the extent of network overlap (standard deviation, 0.52), and subjects in the high network commonality condition reported a mean value of 5.58 for the extent of network overlap (standard deviation, 0.57). The difference was significant ( $t = -28.89, p < 0.01$ ), and hence the manipulation for network commonality worked as anticipated.

Four items measuring *perceived privacy invasion* were adapted from Fusilier and Hoyer (1980) and Alge (2001) (Cronbach’s alpha = 0.82; see the appendix). Five items measuring *perceived relationship bonding* were adapted from Wheelless and Grotz (1976) and

**Table 5** Results of Factor Analysis

	Perceived privacy invasion (PPI)	Perceived relationship bonding (PRB)
PPI1	0.779	0.119
PPI2	0.815	0.052
PPI3	0.830	-0.170
PPI4	0.787	-0.093
PRB1	0.011	0.870
PRB2	-0.013	0.853
PRB3	-0.071	0.870
PRB4	-0.026	0.804
PRB5	-0.001	0.843

Murray et al. (1996) (Cronbach's  $\alpha = 0.90$ ). Exploratory factor analysis shows that, in general, items load well on their intended factors and lightly on the other factor, thus indicating adequate construct validity (see Table 5). The correlation between perceived privacy invasion and perceived relationship bonding was  $-0.18$  ( $p = 0.06$ ).

Whereas subjects' passive responses (i.e., inaction) manifest in their choice of not responding to the note publication, their active responses were classified into three active behavior types (i.e., transactional avoidance, interpersonal avoidance, and approach). Marking the note as spam and reporting the note to Facebook are categorized under transactional avoidance, whereas removing the disseminator as a Facebook friend and reporting the disseminator to Facebook are captured to reflect the behavior of interpersonal avoidance. In addition, giving a "like" and sharing are considered approach behavior. Furthermore, depending on the meaning of message contents, private peer-to-peer messages and public comments are classified into the three active behavior categories as shown in Table 6.

For each response performed, subjects received a score of 1. Overall, a subject could receive (1) a score

**Table 6** Coding Scheme for Content Analysis

Content type	Coding category		
Private peer-to-peer messages	(a) Complaint about note posting	(b) Unhappiness with relationship	(c) Acknowledgment
Public comments	(d) Complaint about note posting	(e) Unhappiness with relationship	(f) Acknowledgment

*Note.* A message/comment that complains about note posting can be "I don't like this note. Remove it!" which is categorized as (a) or (d). An example of a message/comment that expresses unhappiness with the relationship can be "I hate you! Bye," which is categorized as (b) or (e). An acknowledging message/comment can be "I got your funny note! 😊" which is categorized as (c) or (f). Two graduate students, who were not aware of the study's objectives, were asked to conduct a protocol analysis on the textual content. The kappa coefficient is 0.92, indicating substantial agreement between the two coders (Landis and Koch 1977). The differences were completely resolved based on subsequent discussion. All message/comment contents were categorized under these categories without exception.

of 0 and 1 for a passive response or (2) a score of 0, 1, 2, 3, or 4 for transactional avoidance, interpersonal avoidance, or approach (see Table 7).

### 5.3. Control Variables

We included in the model several covariates that might affect individuals' behavioral responses to an embarrassing exposure. The literature on information privacy suggests that individuals' dispositional privacy concerns might affect their online social networking behavior. In addition, individuals' sociability has been shown to influence their online social network usage. Thus, we control for dispositional privacy concerns by using the scale from Awad and Krishnan (2006), and sociability by using the scale from Cheek and Buss (1981). Meanwhile, to control for individuals' online social networking experience and online social network usage intensity, we included the scale from Nosko et al. (2010) and the scale from Oldmeadow et al. (2013), respectively. The correlation matrix is reported in Online Appendix A (available as supplemental material at <http://dx.doi.org/10.1287/isre.2015.0602>).

### 5.4. Results on Perceived Privacy Invasion

A multivariate analysis of variance (MANOVA) was conducted to detect the joint effects of information dissemination and network commonality on perceived privacy invasion and perceived relationship bonding.<sup>4</sup> Results yielded an overall significant effect ( $F(2, 104) = 64.44, p < 0.01$ ). Whereas MANOVA was useful in validating the importance of the independent variables on the dependent variables, its results did not verify their respective effects on each of the dependent variables. Therefore, to test the effects of the independent variables on each of the dependent variables separately, separate analyses of variance (ANOVAs) were conducted.

ANOVA with perceived privacy invasion as the dependent variable reveals the significant effects of information dissemination ( $F(1, 105) = 100.61, p < 0.01$ ) and network commonality ( $F(1, 105) = 22.24, p < 0.01$ ; Table 8). In general, posting with tagging leads to a higher level of perceived privacy invasion than does posting only. Hence, H1A is supported.

Since the interaction effect ( $F(1, 105) = 75.47, p < 0.01$ ) is significant, we further proceed to conduct the simple main effect analysis. Results suggest that the effect of information dissemination on perceived privacy invasion is moderated by network commonality. Simple main effect analysis reveals that (1) posting with tagging is associated with significantly higher perceived privacy invasion than posting only under the low network commonality condition ( $F(1, 53) = 151.69, p < 0.01$ ),

<sup>4</sup> The significant Box's test suggests that the equality of variance-covariance matrices assumption is satisfied.

**Table 7** Categorization of Subjects' Behavioral Responses

Passive response		Active response	
Inaction	Transactional avoidance	Interpersonal avoidance	Approach
(1) No response	(2) Mark the note as spam (3) Report the note to Facebook (4) Send a message that complains about note posting (5) Post a comment that complains about note posting	(6) Remove the disseminator as a Facebook friend (7) Report the disseminator to Facebook (8) Send a private message that expresses unhappiness with the relationship (9) Post a public comment that expresses unhappiness with the relationship	(10) Give a "Like" (11) Share (12) Send a private acknowledging message (13) Post a public acknowledging comment

*Notes.* Items (1) to (13) are coded in binary scores (0 or 1). Transactional avoidance includes items (2) to (5), interpersonal avoidance includes items (6) to (9), and approach includes items (10) to (13). Our result suggests that both avoidance behavior and approach behavior can be performed concurrently in online social networks. In particular, individuals performed acknowledging approach behavior via public responses (i.e., posting an acknowledging comment and/or giving a "Like") and at the same time performed complaining avoidance behavior via private responses (i.e., sending a message complaining about the note posting and/or sending a message expressing unhappiness with the relationship). This implies that users might be highly tactful in responding to involuntary exposures on online social networks. Overall, 35 subjects adopted transactional avoidance. Whereas 51% of them performed only one type of transactional avoidance behavior, 29% performed two types concurrently, and 20% performed three types concurrently. Twenty-five subjects adopted interpersonal avoidance, among whom 56% performed only one type of interpersonal avoidance behavior, 36% performed two types concurrently, and 8% performed three types concurrently. Twenty-seven subjects adopted the approach strategy, among whom 59% performed one type of approach behavior and 41% performed two types concurrently. Most notably, among the 72 subjects who performed at least one active response, 11% performed avoidance and approach behavior concurrently.

and (2) posting only and posting with tagging are not different from each other in affecting perceived privacy invasion under the high network commonality condition ( $F(1, 52) = 1.08, p = 0.31$ ; see Tables 8 and 9, Figure 4). Therefore, H1B is supported.

**Table 8** ANOVA Results and Analysis of Simple Mean Effects

Source	Type III sum of squares	df	Mean square	F	Sig.
<b>Overall sample</b>					
ID	36.60	1	36.60	100.61	0.000
NC	8.09	1	8.09	22.24	0.000
ID × NC	27.45	1	27.45	75.47	0.000
Error	38.19	105	0.36		
Total	2,866.90	109			
<b>NC = Low</b>					
ID	64.35	1	64.35	151.69	0.000
Error	22.48	53	0.42		
Total	86.83	54			
<b>NC = High</b>					
ID	0.33	1	0.33	1.08	0.305
Error	15.71	52	0.30		
Total	16.04	53			

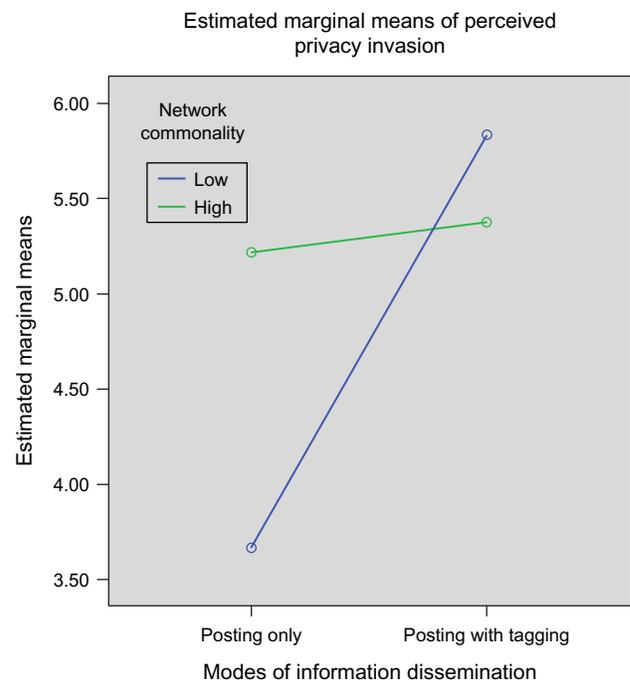
*Notes.* Dependent variable, *perceived privacy invasion*; ID, information dissemination; NC, network commonality.  $R^2 = 0.65$  (adjusted  $R^2 = 0.64$ ).

**Table 9** Mean Values of Perceived Privacy Invasion

	LNC	HNC	Mean
PO	3.66	5.23	4.45
PwT	5.81	5.39	5.61
Mean	4.74	5.31	

*Notes.* LNC, Low network commonality; HNC, high network commonality; PO, posting only; PwT, posting with tagging.

**Figure 4** (Color online) Mean Plot of Perceived Privacy Invasion



**5.5. Results on Perceived Relationship Bonding**

ANOVA with perceived relationship bonding as the dependent variable yields the significant effects of information dissemination ( $F(1, 105) = 8.69, p < 0.01$ ) and network commonality ( $F(1, 105) = 153.43, p < 0.01$ ), as well as a significant interaction effect ( $F(1, 105) = 68.99, p < 0.01$ ; see Table 10).

Simple main effect analysis was conducted to further examine the interaction effect. Specifically, our findings reveal that (1) posting with tagging is associated with significantly lower perceived relationship bonding than posting-only under the low network commonality

**Table 10** ANOVA and Analysis of Simple Mean Effects

Source	Type III sum of squares	df	Mean square	F	Sig.
Overall sample					
ID	4.87	1	4.87	8.69	0.004
NC	85.98	1	85.97	153.43	0.000
ID × NC	38.66	1	38.66	68.99	0.000
Error	58.84	105	0.56		
Total	2,172.44	109			
NC = Low					
ID	35.83	1	35.83	52.52	0.000
Error	36.16	53	0.68		
Total	71.99	54			
NC = High					
ID	7.97	1	7.97	18.26	0.000
Error	22.68	52	0.44		
Total	30.65	53			

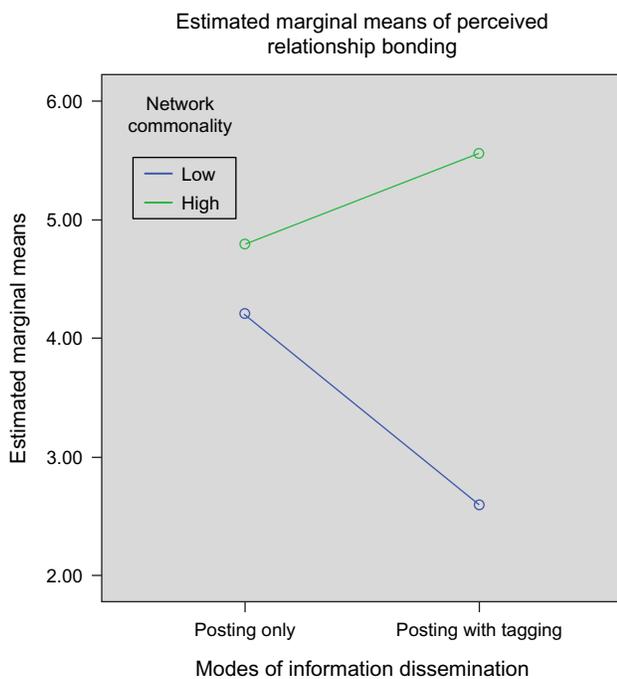
Notes. Dependent variable, *perceived relationship bonding*; ID, information dissemination; NC, network commonality.  $R^2 = 0.69$  (adjusted  $R^2 = 0.68$ ).

**Table 11** Mean Values of Perceived Relationship Bonding

	LNC	HNC	Mean
PO	4.21	4.79	4.51
PwT	2.59	5.56	4.02
Mean	3.39	5.16	

Notes. LNC, Low network commonality; HNC, high network commonality; PO, posting only; PwT, posting with tagging.

condition ( $F(1, 53) = 52.52, p < 0.01$ ), and (2) posting with tagging is associated with significantly higher perceived relationship bonding than posting only under the high network commonality condition ( $F(1, 52) = 18.26, p < 0.01$ ; see Tables 10 and 11, Figure 5). Therefore, H2A and H2B are supported.

**Figure 5** (Color online) Mean Plot of Perceived Relationship Bonding

## 5.6. Results on Behavioral Responses

A binary logistic regression was first conducted to test the effects of perceived privacy invasion and perceived relationship bonding on inaction.<sup>5</sup> Overall, whereas 37 subjects assumed the passive behavioral response, 72 subjects performed at least one active response. To facilitate interpretation of the results, we standardized perceived privacy invasion and perceived relationship bonding scores before fitting the logistic regression models with *inaction* as the outcome in Model A (see Online Appendix C). The Cox and Snell pseudo- $R^2$  is 0.33; hence, Model A correctly predicts about 33% of inaction (whereas the Cox and Snell pseudo- $R^2$  of the covariates-only model is 0.08). As shown in Online Appendix C, both perceived privacy invasion ( $\beta = -0.78, p < 0.01$ ) and perceived relationship bonding ( $\beta = -1.45, p < 0.01$ ) are found to have significant negative effects on inaction. Therefore, H3A and H4A are supported.

Further analyses were conducted to examine the active responses performed by the subjects. Since the three categories of active responses (i.e., transactional avoidance, interpersonal avoidance, and approach) are independent and represented by ordinal variables, we conducted ordinal logistic regressions, in accordance with the guidelines set out by Peng et al. (2002), to test the remaining hypotheses. To facilitate the interpretation of the results, we standardized perceived privacy invasion and perceived relationship bonding scores before fitting the ordinal regression models with each of the three behavior types as outcomes (see Online Appendix C). Following Long (2000), we conducted parallel lines tests for each of the outcome variables and concluded that the proportional odds assumption was met.<sup>6</sup>

In Model B, we conducted an ordinal logistic regression on *transactional avoidance*. Whereas the Cox and Snell pseudo- $R^2$  of Model B is 0.46, that for the covariates-only model is 0.04. This suggests that Model B is a much stronger model than the covariates-only model in predicting transactional avoidance. As shown in Online Appendix C, perceived privacy invasion is

<sup>5</sup> All control variables have an insignificant impact on the endogenous variables (see Online Appendix B).

<sup>6</sup> Ordinal logistic regression only applies to data that meet the parallel regression assumption, which requires equality of coefficients for all outcome categories of the dependent variable (McCullagh 1980). In other words, ordinal logistic regression assumes that the coefficients that describe the relationship between the lowest category of transactional avoidance (i.e., when transactional avoidance equals 0) and all higher categories (i.e., when transactional avoidance equals 1, 2, or 3) are the same as those that describe the relationship between the third category of transactional avoidance (i.e., when transactional avoidance equals 2) and the fourth category (i.e., when transactional avoidance equals 3). Our test revealed that the difference in the coefficients was not significant, and thus the proportional odds assumption was met.

found to have a significant positive effect on transactional avoidance ( $\beta = 2.90, p < 0.01$ ). Furthermore, perceived relationship bonding is found to have a significant negative effect on transactional avoidance ( $\beta = -0.62, p < 0.01$ ). Therefore, H3B and H4B are supported.

In Model C, an ordinal logistic regression was conducted on *interpersonal avoidance*. The Cox and Snell pseudo- $R^2$  is 0.23 for Model C and 0.02 for the covariates-only model, suggesting that Model C is a much stronger model than the covariates-only model in predicting interpersonal avoidance. Perceived relationship bonding is found to have a significant negative effect on interpersonal avoidance ( $\beta = -1.01, p < 0.05$ ). However, contrary to expectation, perceived privacy invasion is found to have no significant influence on interpersonal avoidance ( $\beta = -0.71, p = 0.23$ ). Hence, H4C is supported, but H3C is not.

In Model D, an ordinal logistic regression was conducted on *approach*. The Cox and Snell pseudo- $R^2$  is 0.33 for Model D and 0.02 for the covariates-only model. This suggests that Model D is a much stronger model than the covariates-only model in predicting approach. Perceived privacy invasion has a significant and negative effect on approach ( $\beta = -1.17, p < 0.05$ ). Furthermore, perceived relationship bonding is found to have a significant and positive effect on approach behavior ( $\beta = 3.24, p < 0.01$ ). Therefore, H3D and H4D are supported.

Furthermore, a mediation analysis was conducted following Baron and Kenny (1986) (see Online Appendix D). The results suggest that the two mediating variables, namely, perceived privacy invasion and perceived relationship bonding, fully mediate the effects of information dissemination and network commonality on the four dependent variables.

## 6. Discussion and Concluding Remarks

### 6.1. Discussion of Results

The results supported all hypotheses but H3C. The findings of our experiment provide strong evidence that information dissemination and network commonality jointly influence individuals' perceived privacy invasion and perceived relationship bonding. In addition, whereas perceived privacy invasion increases transactional avoidance, it reduces approach behavior. Furthermore, whereas perceived relationship bonding impedes both transactional avoidance and interpersonal avoidance, it leads to approach behavior.

However, contrary to our expectation, perceived privacy invasion has no significant influence on interpersonal avoidance. The results imply that although perception of privacy invasion is likely to induce withdrawal from an embarrassing exposure, it is not strong enough to elicit relationship dissolution. A plausible

explanation is that the target's existing relationship with the disseminator dissuades her from engaging in relationship avoidance. As noted by Rusbult and Martz (1995), individuals' relational investment played an important role in their decision to maintain relationships with abusive others. An obtrusive avoidance of interpersonal relation might be considered direct confrontation against the disseminator, thus incurring potential repercussions. Likewise, in the context of online social networks, the target may be unwilling to terminate a relationship despite an elevated perception of privacy invasion following the embarrassing exposure.

### 6.2. Theoretical Contributions

This study offers important theoretical contributions by integrating the privacy literature and teasing literature under the social exchange framework. In doing so, we provide fresh insights into the privacy invasion–relationship bonding paradox in assessing the impact of involuntary embarrassing exposures in online social networks and individuals' ensuing behavioral responses.

**6.2.1. Disentangling the Privacy Invasion—Relationship Bonding Paradox.** Despite the prevalence of embarrassing exposures by others in online social networks, little is known about privacy issues beyond voluntary revelation of personal information. This study addresses this gap in the privacy literature by identifying the key antecedents of individuals' exchange assessment in online embarrassing exposures, namely, *information dissemination* and *network commonality*. In line with past privacy studies examining the impact of individuation (Postmes and Spears 1998), we advance the information privacy literature by highlighting how target individuation can be facilitated by posting with tagging through enhanced traceability in online social networks. Prior literature suggests that individuation is often achieved by the revelation of one's identity (such as name, ID, etc.; e.g., Wattal et al. 2012), which can be most effective when the audience already knows the target (otherwise, the identity information is less meaningful). However, posting with tagging can boost target individuation by allowing the target to be traceable via a dedicated hyperlink, even when the audience does not know the target.

This study also demonstrates how network commonality (i.e., low network commonality versus high network commonality) moderates the impact of information dissemination through affecting the audience size of online embarrassing exposures. Past research revealed that the effect of target individuation can be amplified when the audience size escalates beyond a few interactants in offline social interactions (Petronio 2002). This study clarifies that a small gain in overall audience size, facilitated jointly by posting with tagging and high network commonality, would not

lead to a marked increase in the target's perception of privacy invasion. By contrast, a substantial gain in overall audience size, produced by posting with tagging and low network commonality, is found to significantly enhance privacy invasion perception. Our findings complement privacy studies examining target individuation in the offline contexts and, more importantly, enrich the theoretical development of the privacy literature by unearthing the interplay between information dissemination and network commonality in shaping privacy invasion perception in online social networks.

In addition, this study contributes to the teasing literature by elucidating the effects of *information dissemination* and *network commonality* on perceived relationship bonding. In particular, we draw on the findings of the teasing literature on audience type to better understand embarrassing exposure. Past teasing research has mostly focused on the impact of embarrassing exposures when the audience is made up of friends (e.g., Kruger et al. 2006). Nevertheless, when the audience consists of both friends and strangers, little is known about the impact of this audience type on the target's interpretation of embarrassing exposures. This study shows that, depending on whether an embarrassing content is exposed to an audience consisting of primarily strangers or primarily known friends, the target would focus on either the humiliating aspect or the humorous aspect of the exposure.

We also rely on the role played by target participation in teasing to explain the effect of information dissemination in online embarrassing exposures. Target participation is known to be a key consideration when individuals interpret embarrassing exposures. Past research on offline embarrassing exposures (such as rumors) has largely focused on transient social exchange in which target participation is defunct with the conclusion of social events. In online social networks, embarrassing exposures are facilitated by the dissemination of digital information, which allows the target to take part in the exposure over time. For example, on Facebook, embarrassing exposures are archived as chronological events, which remain permanently retrievable and visible, and hence facilitating deferred target participation. To this end, we extend the teasing literature by demonstrating how target participation can be facilitated in online embarrassing exposures.

Taken together, we extend the boundary of knowledge in information privacy and teasing by integrating these two streams of literature to explain the impact of involuntary embarrassing exposures in online social networks.

**6.2.2. Reaction to Involuntary Embarrassing Exposures.** This study theoretically identifies and empirically demonstrates inaction, avoidance, and approach as key user reactions to involuntary embarrassing

exposures in online social networks. It should be noted that past IS research has mainly focused on elucidating avoidance as a one-dimensional reaction, ignoring the possibility that avoidance can be exercised at different levels. To this end, we provide insights into avoidance responses by identifying two independent levels of avoidance, namely, transactional avoidance and interpersonal avoidance. As shown in the results, transactional avoidance was determined not only by perceived privacy invasion but also by perceived relationship bonding. However, interpersonal avoidance was only determined by perceived relationship bonding. In this sense, this study contributes to IS research by showing that the two types of avoidance should not be treated collectively as a single user reaction to embarrassing exposures.

### 6.3. Practical Contributions

This study reveals new insights on relationship maintenance in online social networks. Our study reveals that users may engage in avoidance responses to distance themselves from not only the involuntary embarrassing exposure but also the person responsible for the embarrassing exposure. Given the significant consequence of embarrassing exposures on interpersonal relationships, we recommend that online social network users carefully consider not just the content to be published but also the audience of the publication. In particular, we advocate that users prudently evaluate the audience prior to disseminating embarrassing information to tease their friends. Users are encouraged to exercise explicit efforts to ensure embarrassing exposure is limited to mutual friends. Otherwise, a benign expression of affection might turn into unintentional humiliation that damages relationships.

We also recommend that online social networking websites enhance existing technical features to effectively mitigate the impact of avoidance behavior. This study reveals that stronger relationship bonding can reduce interpersonal avoidance. However, despite an elevated perception of privacy invasion, individuals appear reluctant to perform interpersonal avoidance, possibly due to the concern that current interpersonal avoidance methods (such as removing the disseminator as a Facebook friend and reporting the disseminator to Facebook) might trigger direct confrontations with the disseminator. Hence, to prevent provoking the disseminator, individuals refrain from performing interpersonal avoidance. To this end, we advocate that service providers allow individuals to skillfully de-escalate their relationships. For example, to distance oneself from the disseminator, users should be permitted to perform gradual relationship dissolution by progressively excluding the disseminator from her online social networking activities. Our recommendation is an extension of the selective sharing feature in Google+, which allows users to reduce the

exposure of their social networking activities. By extending this technical feature to relationship dissolution, users can tactfully conceal their social activities from the disseminator and hence gradually establish severance from her.

#### 6.4. Limitations and Future Research

This study examines embarrassing exposures in a context where a note containing the target's embarrassing information is disseminated through posting only versus posting with tagging. We do not attempt to generalize the results to other forms of information dissemination in online social networks. For example, the disseminator might expose the target's age by writing birthday wishes directly on her wall (Smock et al. 2011). In such a case, since the embarrassing information resides in the target's personal profile, the effects of posting with tagging (i.e., notification and profile linkage) on perceived privacy invasion and perceived relationship bonding may be different.

Our contributions may also be limited by using a mock-up online social networking website. Although the general layout and technical features of the mock-up website resembled those of a real online social networking platform, the mock-up website may not reflect the actual online social networking environment entirely. However, in the actual environment, we could neither manipulate the experimental conditions (i.e., controlling the number of mutual friends the subjects and the friend share) nor capture subjects' actual behavioral responses (i.e., intercepting the private messages the subjects sent to her friends). Therefore, despite the limitation, the employment of this mock-up website is necessary. We encourage researchers to verify the impact of embarrassing exposures on privacy invasion and relationship bonding in a more natural setting.

This study shows the effects of social exchange structure on individuals' privacy and relationship bonding perceptions in embarrassing exposures. In the present study, social exchange structure is represented by network commonality, which focuses on the number of common friends between two individuals. However, the relationship structure between disseminators and targets is likely more complex than what is captured by network commonality, which reflects the quantitative

aspect of relationships. Individuals might have relationships that are vastly different qualitatively. In online social networks, individuals might have both friends with strong ties and those with weak ties. Therefore, future research will be needed to examine whether relational closeness might affect individuals' responses to involuntary embarrassing exposures, and if so, how.

Finally, whereas past IS studies exploring the concurrent performance of avoidance and approach behavior have typically considered their reactions toward avoidance-inducing stimuli and approach-inducing stimuli in an environment, respectively (e.g., Arazy and Gellatly 2012), this study reveals that a single stimulus, in the form of an online embarrassing exposure, could simultaneously engender avoidance and approach. Hence, it would be interesting for future research to examine users' concurrent avoidance and approach behavior in other contexts.

#### 6.5. Conclusion

Privacy issues associated with involuntary online exposures are increasingly common in social media. This study represents one of the first attempts to integrate theories on social exchange, privacy, and teasing to a specific context of online embarrassing exposures. Our results reveal that information dissemination and network commonality interact to affect perceived privacy invasion and perceived relationship bonding, which in turn influence individuals' behavioral responses to embarrassing exposures. These results serve as a basis for future theoretical development in the area of information privacy and yield valuable insights that can guide practice.

#### Supplemental Material

Supplemental material to this paper is available at <http://dx.doi.org/10.1287/isre.2015.0602>.

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#### Appendix. Measurement Items

Information dissemination (ID; true/false)

- ID1 I am tagged in the note published by X.
- ID2 X has tagged me to the note.
- ID3 The note published by X has become a "Notes about me" because it is tagged to my profile.

Network commonality (NC)

- NC1 My online social network overlaps considerably with that of X.
- NC2 X and I have many common friends in the online social network.
- NC3 My online social network is highly similar to that of X.
- NC4 Many of my friends are also friends of X in the online social network.

**Appendix. (Cont'd.)**

Perceived privacy invasion (PPI) (adapted from Fusilier and Hoyer 1980 and Alge 2001)	
PPI1	I feel comfortable with the note about me being made public in this way. (r)
PPI2	I feel X needs to exercise greater controls to limit this kind of note publication.
PPI3	I feel that the note is none of anybody's business but my own.
PPI4	I feel my exposure in the note was an invasion of my privacy.
Perceived relationship bonding (PRB) (adapted from Wheelless and Grotz 1976 and Murray et al. 1996)	
PRB1	After reading the note I feel very close to X.
PRB2	After reading the note, I am willing to disclose a great deal of positive and negative things about myself, honestly and fully, to X.
PRB3	After reading the note I am extremely happy with my relationship with X.
PRB4	After reading the note I think my relationship with X is very strong.
PRB5	After reading the note, I do not feel that my relationship with X is successful. (r)
Dispositional privacy concerns (DPC) (adapted from Awad and Krishnan 2006)	
DPC1	In general, I am concerned about threats to my personal privacy.
DPC2	I am concerned about threats to my personal privacy when using the Internet.
Sociability (SO) (adapted from Cheek and Buss 1981)	
SO1	I like to be with people.
SO2	I welcome the opportunity to mix socially with people.
SO3	I prefer working with others rather than alone.
Facebook familiarity (FF) (adapted from Nosko et al. 2010)	
FF1	I am familiar with using Facebook.
FF2	I am comfortable with using Facebook.
Facebook usage intensity (FUI) (adapted from Oldmeadow et al. 2013)	
FUI1	I am a frequent user of Facebook.
FUI2	I often use Facebook.

*Notes.* Unless indicated otherwise, the anchors for all items are 1 = strongly disagree to 7 = strongly agree. (r), reverse item.

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