The purpose of this study was to examine differences in self-disclosure goals, privacy concerns, and self-disclosure characteristics between Facebook and Twitter. These sites were compared in terms of audience representations, based on structural cues that suggest potential audiences for a user. We conceptualized audience representations in 2 ways: based on privacy boundaries that imply bounded versus unbounded audiences, and on network characteristics such as size and diversity for audiences within the boundary. Results revealed that self-disclosure goals, privacy concerns, and self-disclosure intimacy were different depending on the privacy boundary. Network characteristics were also important, but effects were moderated by the privacy boundary type, suggesting a complex interplay between the 2 types of audience representations in shaping self-disclosure in social media.

Keywords: Social Network Sites, Self-Disclosure, Functional Model of Self-Disclosure, Communication Privacy Management Theory, Computer-Mediated Communication, Facebook, Twitter.

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Self-disclosure plays a central role in our lives, and not a day goes by without an individual having disclosed at least one, if not several pieces of personal information to others. Broadly defined, self-disclosure is the process of revealing personal information to someone else (Greene, Derlega, & Mathews, 2006). Recently, self-disclosure research has turned attention to how people share personal information in social network sites (SNSs), and how the semipublic nature of SNSs influences self-disclosure production (e.g., Bazarova & Choi, 2014; Jin, 2013), its perceptions (e.g., Bazarova, 2012), and its role in the development of personal relationships (e.g., Ledbetter et al., 2011). While self-disclosure to mass or public audiences is not an entirely new phenomenon (Goffman, 1959; Priest & Dominick, 1994), it has now become much more
frequent and integrated into people's lives because of the introduction of new technologies.

The bulk of research on self-disclosure and SNSs has been conducted on a single SNS (e.g., Naaman, Boase, & Lai, 2010; Vitak, 2012; Young & Quan-Haase, 2009). However, about 42% of online adults use multiple SNSs (Duggan & Smith, 2013), which calls for an examination of self-disclosure in the context of multiple sites. The comparison between different SNSs can reveal a dynamic interplay between features of technology and self-disclosure practices that emerge within the context of a specific SNS because each site carries with it affordances that structure communicative actions (Tufekci, 2014). For example, differences between Facebook and Twitter influence how actively people use each site (Davenport, Bergman, Bergman, & Fearrington, 2014) and the self-presentation strategies they use on these sites (Panek, Nardis, & Konrath, 2013).

To advance the understanding of mechanisms underlying self-disclosure, this study integrates the functional model, which connects self-disclosure goals and self-disclosure intimacy with audience representations (Bazarova & Choi, 2014), with the concept of privacy boundaries from communication privacy management (CPM) theory (Petronio, 2002). A key element of this process is audience representations, which refer to cues within an SNS that suggest potential audiences for a user.

To enable comparisons between different SNSs, we conceptualize audience representations in two ways: based on privacy boundaries that imply bounded versus unbounded audiences, and based on network characteristics of audiences within the boundary. These representations are used to predict self-disclosure behaviors and privacy concerns on Facebook and Twitter.

The functional model of self-disclosure

Although most self-disclosure research in social media has focused on a single SNS, even within a single site there can be several communication channels with different potential audiences and affordances. For example, Facebook has channels that vary in the degree of network visibility: Private messages are visible only to a selected person, whereas status updates and posts on others’ walls are by default visible to a whole network of friends. These channels also vary by the level of interaction directedness: Private messages and posts on others’ walls are typically directed at a specific person, but status updates are usually not directed at anyone in particular. The differences in interaction directedness and network visibility have been linked to a variety of self-disclosure processes, including self-disclosure perceptions (Bazarova, 2012), the role of self-disclosure in fostering social connectedness on SNSs (Utz, 2014), and strategic uses of self-disclosure and expression of emotions (Bazarova, Taft, Choi, & Cosley, 2013).

Interaction directedness and network visibility may have these effects because they suggest different audiences to a user. Knowing one's audience is difficult in social media, and people base their communicative actions on a mental image or conceptualization of audiences, also known as the “imagined audience” (Marwick &
boyd, 2011). People form these mental images partly based on cues about audience, or audience representations, embedded in a communication channel (Bazarova & Choi, 2014). For example, a friend’s wall or a private message is likely to evoke a mental image of that friend; whereas in a nondirected status update, people are more likely to think of an audience in general terms. Site features that display information about network connections such as the number of friends or followers may also constitute audience cues and impact how people mentally construct their audience (Litt, 2012).

Audience representations embedded in SNS channels affect what people share and the rewards or goals they seek to attain through self-disclosure. According to the functional approach of self-disclosure in social media (Bazarova & Choi, 2014), self-disclosure goals account for differences in self-disclosure behaviors in SNS channels with different audience representations. According to a content analysis of self-disclosure goals in Bazarova and Choi’s (2014) study, these goals include a desire for self-expression, relational development, social validation, and approval, gaining social resources and information, benefitting others by sharing information, and managing one’s identity.

A comparison of self-disclosure goals in Facebook status updates, posts on others’ walls, and private messages showed that social validation and self-expression goals were most common in nondirected status updates broadcasted to a whole network. In directed private messages and posts on others’ walls, people pursued more relational development goals, presumably because the nature of directed communication implies a specific person rather than the whole audience. At the same time, network visibility also played a role in that people pursued more social validation goals in network-visible status updates and posts on others’ walls compared to private messages. Consistent with the functional approach, self-disclosure goals accounted for the increased intimacy of self-disclosure in private messages compared with status updates and posts on others’ walls.

If audience representations are essential to how people perceive audiences and self-disclose to them, understanding how people share personal information in social media calls for a comparison of audience representations as overarching qualities that span across SNSs. In the next section, we draw on the concept of privacy boundaries to investigate audience representations as a distinguishing quality of each SNS. We also examine their role in privacy concerns and self-disclosure behaviors on Facebook and Twitter.

**Audience representations as cues for audience perception in Facebook versus Twitter**

While audience structure, as captured by interaction directedness and network visibility, reflects a representation of audiences within a user’s network, a SNS also carries with it structures and settings that establish a boundary for outside audiences (i.e., those who are not part of a user’s network on the site). In this sense, the privacy and disclosure choices of SNS users are influenced by a specific SNS structure within which people negotiate their individual preferences (Stutzman, Gross, & Acquisti,
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2012). The site structure regulates who can have access to the site and potentially to one’s account.

For example, Facebook membership was initially restricted to university students, but eventually opened itself to all types of users, and users can change privacy settings to regulate access to their profile. Twitter is public and accessible to anyone by default, but users can adjust privacy settings to make their account “protected” if they wish to restrict access only to certain followers. To explain further the role of SNSs’ structures in creating audience representations, and to explicate the relationship between representations of audiences outside and within the boundary, we now turn to CPM theory (Petronio, 2002) and its concept of privacy boundaries.

Privacy boundaries as audience representations on SNSs

CPM theory lays out the concept of boundaries around private information as crucial in managing self-disclosure and privacy (Petronio, 2002). Privacy boundary management on SNSs has been characterized in terms of different SNS activities, such as changing profile privacy settings (Stutzman & Kramer-Duffield, 2010), maintaining multiple SNS profiles (Stutzman & Hartzog, 2012), and as being constituted by individuals’ network characteristics (Walton & Rice, 2013). In this paper, we link privacy boundaries to an SNS’s structure and its settings because they can give rise to perceptions of one’s audience on the site (Litt, 2012).

When a self-disclosure is shared with others on a SNS, the information moves from a personal privacy boundary to a collective privacy boundary, and the latter encompasses the entire audience of the disclosure. As a consequence, a network of friends or followers with whom a disclosure is shared on Facebook or Twitter becomes a “collective management system” (Petronio, 2002, p. 6), which collectively owns the shared information. In addition to the collective ownership of information, members of a collective management system share the mutual control of information. According to CPM theory, the coordination of privacy boundaries involves three operations: boundary linkage, boundary permeability, and boundary ownership.

Boundary linkage occurs when personal boundaries are joined or linked together to form a collective boundary through the act of disclosure. On the other hand, boundary permeability describes the degree of boundary openness that permits information flow outside the boundary and public access to it. When people have tight control over information within the boundary, boundary permeability is low; when boundary permeability is high, information easily flows outside the boundary to be publicly known and accessible.

Finally, boundary ownership refers to expectations that come with co-owning private information within a boundary, such as agreements on how private information should or should not be disseminated. However, people can sometimes experience a loss of control over the ownership of information, as boundaries can “shift to include individuals who are not chosen by the original owners to know the information” (Petronio, 2002, p. 106), as a consequence of boundary permeability. Thus, people are
more concerned about their privacy and more hesitant to reveal personal information in a public space (Bateman, Pike, & Butler, 2011).

To integrate the concept of privacy boundaries with the functional model (Bazarova & Choi, 2014), we argue that boundaries reflected in a SNS give rise to different audience representations by impacting who disclosers perceive as their potential audience. For instance, Twitter has a built-in retweet function, and users frequently employ hashtags that make tweets accessible on a public search feed, which actively promotes boundary linkage and the dissemination of information to outside audiences. Furthermore, Twitter accounts set to public privacy settings allow unidirectional following, which means that anybody on Twitter can potentially become part of the account holder’s collective privacy boundary and receive access to self-disclosures. As such, public Twitter accounts imply loosely defined ownership, highly permeable boundaries, and higher possibilities of linkage, which suggest unbounded audiences. By contrast, protected Twitter accounts and Facebook restrict the audience to only those whom the account owner approves, evoking more clearly defined ownership, less permeable boundaries, and fewer chances of boundary linkage.

By conceptualizing SNSs in terms of boundaries that vary in the level of ownership, permeability, and linkage, we argue that these boundaries are a form of audience representations that affect users’ perceptions of audiences as being bounded versus unbounded. Moreover, because loosely defined boundaries imply less control over information and its co-ownership with less familiar and unbounded audiences, we expect to see less intimate self-disclosure, different types of goals (particularly less relational development goals and more social validation goals), and more privacy concerns in SNSs with more permeable boundaries. Moreover, we further expect that different self-disclosure goals will be associated with different self-disclosure intimacy, specifically with more intimate disclosures for relational goals compared with social validation goals, based on the results from Bazarova and Choi (2014). Therefore,

- **H1**: Public Twitter accounts have less intimate self-disclosure compared to (a) Facebook and (b) protected Twitter accounts.
- **H2**: Public Twitter accounts have different types of self-disclosure goals, particularly, fewer relational development goals and more social validation goals, compared to (a) Facebook and (b) protected Twitter accounts.
- **H3**: Public Twitter accounts are associated with more privacy concerns compared to (a) Facebook and (b) protected Twitter accounts.
- **H4**: Self-disclosure goals are associated with different self-disclosure intimacy such that disclosures motivated by relational development goals are more intimate than disclosures motivated by social validation goals.

**Network characteristics as audience representations**

In addition to audience representations as defined by privacy boundaries, the composition of one’s network within a particular SNS can also influence perceptions of the audience within a boundary. Studies that have focused on a single SNS have often found that network characteristics are directly related to amounts or characteristics
of self-disclosure, in that certain features of the network, such as its size and diversity, affect self-disclosure and privacy, although not always in predicted directions. For instance, larger and more diverse audiences were associated with the use of more sophisticated privacy controls, and higher privacy concerns were associated with less self-disclosure on Facebook (Vitak, 2012). However, the same study also found that increases in the size and diversity of the network were associated with a larger amount of self-disclosure. Similarly, people were more likely to reveal personal information on Facebook (Young & Quan-Haase, 2009) and disclosed more emotions on Twitter (Kivran-Swaine & Naaman, 2011) when they had larger friend networks.

A recent study of self-disclosures on Twitter also characterized boundary permeability in terms of network characteristics, and found that people self-disclosed more in more permeable boundaries (Walton & Rice, 2013). Even though this study did not consider privacy settings such as public or protected accounts that may further impact audience perceptions, it is one of the first that has attempted to integrate the concept of privacy boundaries with individuals’ network characteristics.

Because prior studies have mostly been conducted regarding a single SNS, they tended to conceptualize and observe a direct effect of network characteristics on self-disclosure. An important question arises as to how the two types of audience representations, as defined by network characteristics and privacy boundaries, may interplay with each other. That is, network characteristics may affect self-disclosure differently depending on the privacy boundary type. In particular, self-disclosure behaviors may be guided less by the size and diversity of the immediate network if shared disclosures are potentially accessible to anyone outside the network boundary, in contrast to media with more clearly defined boundary ownership. Thus, the effect of network characteristics on self-disclosure intimacy may be moderated by the privacy boundary such that network characteristics have a larger influence for more clearly defined and less permeable boundaries than for open ones. Therefore,

H5: There is an interaction between privacy boundary type and network size on self-disclosure intimacy such that increases in network size have a greater effect on self-disclosure intimacy in (a) Facebook and (b) protected Twitter accounts compared to public Twitter accounts.

H6: There is an interaction between privacy boundary type and network diversity on self-disclosure intimacy such that increases in network diversity have a greater effect on self-disclosure intimacy in (a) Facebook and (b) protected Twitter accounts compared to public Twitter accounts.

Method

Participants
A sample of college students (N = 164) from a university in the northeastern United States were recruited to participate in the study for extra credit in psychology, human development, and communication courses. Participants were required to hold an active account on both Facebook and Twitter, to allow for comparisons between the same users over both media. The age of participants ranged from 18
to 23 ($M = 20.17$, $SD = 1.19$). The gender distribution was 72.6% female ($N = 119$) and 27.4% male ($N = 45$). On average, participants had had a Facebook account for 5 years 10 months, and spent an average of 2 hours 20 minutes on Facebook daily. For Twitter, participants had had an account for 2 years on average, and spent an average of 50 minutes on the site daily. In addition, 31.7% of participants ($N = 52$) had a public Twitter account, and 54.3% ($N = 89$) had a protected Twitter account. Data from the Twitter section of the survey of those who replied that they did not know their Twitter privacy setting ($N = 23$, 14%) were excluded from analysis. All participants indicated that their Facebook account was not public, and had privacy settings that restricted the account access.

**Procedure**

After giving consent, participants were asked to provide verbatim their five most recent status updates from Facebook and their five most recent tweets from Twitter. Some participants did not enter all 10 communication instances, resulting in a smaller overall number of messages ($N = 1,629$). Data from participants who entered three or fewer messages were not used. Communication instances that participants made available only to a portion of their Facebook friends using the custom friend list feature were also excluded ($N = 83; 5\%$), and no retweets or mentions (@-replies) were collected. Participants were instructed to only provide messages that were less than 6 months old at the time of participation to facilitate the recall of self-disclosure goals. Then, they were asked to answer questions about each message that they had provided, general Facebook and Twitter usage, and demographics. Data were collected in the spring of 2013.

**Measures**

*Network size and diversity*

Network size was measured through the total number of participants’ Facebook friends and Twitter followers, as reported by participants. The network diversity measure was adapted from Manago, Taylor, and Greenfield’s (2012) study by asking participants to select from a range of 23 relationship categories (e.g., family member and best friend) to tap into different social groups and circles that could be present within each person’s network. Participants were instructed to select all the categories present in their Facebook friend or Twitter follower network. The ratio of the number of categories selected by a participant to the total number of possible categories represented a measure of network diversity (see Table 1).

*Privacy concerns*

Privacy concerns were gauged using three items from Vitak’s (2012) study, on a scale of 1 = “strongly disagree” to 7 = “strongly agree” ($\alpha = .84$ for Facebook, $\alpha = .92$ for Twitter; see Table 1 for summary statistics). For example, “I am careful in what I post to Facebook/Twitter because I worry about people who are not my friends seeing it.” These measures can also represent concerns about boundary rule violations by
Table 1  Descriptive Statistics for Network Size, Network Diversity, Privacy Concerns, and Self-Disclosure Intimacy

<table>
<thead>
<tr>
<th>Measure</th>
<th>Range</th>
<th>M</th>
<th>Mdn</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>77.00</td>
<td>2734.00</td>
<td>1048.62</td>
<td>978.00</td>
</tr>
<tr>
<td>Twitter</td>
<td>2.00</td>
<td>2111.00</td>
<td>142.67</td>
<td>76.50</td>
</tr>
<tr>
<td>Network diversity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>.0435</td>
<td>.9565</td>
<td>.6702</td>
<td>.6957</td>
</tr>
<tr>
<td>Twitter</td>
<td>.0435</td>
<td>.9565</td>
<td>.3680</td>
<td>.3478</td>
</tr>
<tr>
<td>Privacy concerns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>1.00</td>
<td>7.00</td>
<td>4.53</td>
<td>4.67</td>
</tr>
<tr>
<td>Twitter</td>
<td>1.00</td>
<td>7.00</td>
<td>4.08</td>
<td>4.00</td>
</tr>
<tr>
<td>Disclosure intimacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>1.00</td>
<td>7.00</td>
<td>3.66</td>
<td>3.73</td>
</tr>
<tr>
<td>Twitter</td>
<td>1.00</td>
<td>6.40</td>
<td>3.11</td>
<td>3.10</td>
</tr>
</tbody>
</table>

others (Petronio, 2002), as they reflect concerns about access of personal information by third parties (Vitak, 2012).

Self-disclosure presence coding
To determine whether a communication instance contained self-disclosure, two independent coders coded all tweets and status updates for the presence of self-disclosure using the following definition: a verbal statement that describes the subject in some way, tells something about the subject, or refers to some aspect of the subject experiences (Chelune, 1975). As marginal proportions of categories were not determined beforehand, intercoder reliability was calculated using free marginal kappa (Brennan & Prediger, 1981), and was acceptable (κ = .78). Conflicting codes were resolved through discussion sessions between the coders and the first author. Overall, 67.6% of Facebook status updates and 63.4% of tweets contained self-disclosures.

Self-disclosure goal coding
Additional coding was conducted on participants’ open-ended responses to the question “What goal did you try to accomplish with this message?” The average length of response to this question was 13.12 words (Min = 1, Max = 72, SD = 9.04). The coding scheme was adapted from Bazarova and Choi (2014), which included seven categories: identity clarification, relational development, sharing information, storage and entertainment, social validation, social control, and self-expression (see Table 2 for percentage distributions of goals). Two different coders were trained to be familiar with the coding scheme over multiple training sessions, and then coded the goals for all messages that contained a self-disclosure (κ = .77). For messages that were reported to have two goals, both goals were incorporated as separate instances in the analyses.
Table 2  Self-Disclosure Goal Distributions and Least Squares Means for Self-Disclosure Intimacy

<table>
<thead>
<tr>
<th>Identity clarification</th>
<th>$M$ (SE)</th>
<th>3.62 (0.24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relational development</td>
<td>$M$ (SE)</td>
<td>4.07b (0.13)</td>
</tr>
<tr>
<td>Sharing information</td>
<td>$M$ (SE)</td>
<td>3.48cd (0.14)</td>
</tr>
<tr>
<td>Storage and entertainment</td>
<td>$M$ (SE)</td>
<td>3.25 (0.45)</td>
</tr>
<tr>
<td>Social validation</td>
<td>$M$ (SE)</td>
<td>3.15cef (0.10)</td>
</tr>
<tr>
<td>Social control</td>
<td>$M$ (SE)</td>
<td>2.87ace (0.23)</td>
</tr>
<tr>
<td>Self-expression</td>
<td>$M$ (SE)</td>
<td>3.64cgh (0.11)</td>
</tr>
</tbody>
</table>

Note: Significant differences in least squares means are indicated by a different superscript.

Self-disclosure intimacy

Finally, participants rated the intimacy of each message that they provided on three dimensions adapted from Bazarova (2012): “nonintimate-intimate,” “impersonal-personal,” and “public-private” ($\alpha = .78$), using a 7-point semantic differential scale (see Table 1). The analysis of self-disclosure intimacy was conducted only on messages that had been coded as containing a self-disclosure.

Results

Because measures for multiple messages were collected from the same participant, the data were in the form of repeated measures with self-disclosure intimacy and goals measured repeatedly for all the participants in the sample across both SNS conditions (i.e., Facebook and Twitter). In this case, multilevel modeling (MLM) can be used to account for the nonindependence of data at the participant level (Hayes, 2006). Thus, for this study, MLM was used, and message-level variables (i.e., self-disclosure goals and self-disclosure intimacy) were nested under participant-level variables (i.e., network size, network diversity, and privacy concerns), which were modeled on a higher level. All independent variables were grand mean centered prior to analysis. Table 3 shows bivariate correlations between main variables.

The effect of privacy boundaries

Analyses were conducted using the SAS MIXED and GLIMMIX procedures that can fit mixed-effects models to nonindependent data with continuous and discrete outcomes (Allison, 2012). Hypotheses 1–3 predicted the effects of privacy boundaries, which stated that media with more permeable boundaries (e.g., public Twitter) have less intimate self-disclosure (H1), different self-disclosure goals (H2), and less privacy concerns (H3) compared with Facebook and protected Twitter accounts. All analyses
Extending the Functional Model to Multiple SNS  
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Table 3  Bivariate Correlations Between Variables

<table>
<thead>
<tr>
<th></th>
<th>Network Size</th>
<th>Network Diversity</th>
<th>Privacy Concerns</th>
<th>Disclosure Intimacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network size</td>
<td>—</td>
<td>.62**</td>
<td>.03</td>
<td>.15**</td>
</tr>
<tr>
<td>Network diversity</td>
<td>—</td>
<td>—</td>
<td>.02</td>
<td>.12**</td>
</tr>
<tr>
<td>Privacy concerns</td>
<td>—</td>
<td>—</td>
<td>.16**</td>
<td></td>
</tr>
<tr>
<td>Disclosure intimacy</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the .01 level (two tailed).

were conducted controlling for demographic variables (age, gender, ethnicity), Facebook and Twitter use (time spent per day on site, months having an account), and message length, but only message length was significant and is reported below.

First, we explored the effects of privacy boundaries on self-disclosure intimacy. The intraclass correlation (ICC) for this model was .3417, indicating that 34.17% of the total variance in self-disclosure intimacy was accounted for by differences between participants. The effect of boundary was significant, $p < .001$, $\eta^2 = .09$, with self-disclosure in Facebook being the most intimate, followed by protected Twitter, and then public Twitter (see Table 4). However, an analysis of least squares means revealed that self-disclosure intimacy between public and protected Twitter was not significantly different, $t(816) = -1.45$, $p = .15$. Facebook, however, was significantly different from both public Twitter, $t(816) = 6.05$, $p < .001$, and protected Twitter, $t(816) = 5.41$, $p < .001$, with people self-disclosing more intimately on Facebook compared with both public and protected Twitter. The effect of message length was also significant, $F(1, 816) = 15.41$, $p < .001$, with longer messages being more intimate, but controlling for message length did not change the effect of boundary type. Thus, these results are consistent with H1a, as public Twitter accounts had less intimate disclosure than Facebook, while H1b was not supported, as there were no differences in intimacy between public and protected Twitter accounts.

Table 4  Resulting Least Squares Means, Standard Errors, and Test Statistics for Hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Facebook, M (SE)</th>
<th>Public Twitter, M (SE)</th>
<th>Protected Twitter, M (SE)</th>
<th>Privacy Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Self-disclosure</td>
<td>3.94 (.09)</td>
<td>3.19 (.13)</td>
<td>3.41 (.11)</td>
<td>F(2, 816) = 30.24, $p &lt; .001$</td>
</tr>
<tr>
<td>H2: Relational</td>
<td>.29 (.12)</td>
<td>.11 (.27)</td>
<td>.16 (.18)</td>
<td>F(2, 1025) = 8.52, $p &lt; .001$</td>
</tr>
<tr>
<td>H2: Social validation</td>
<td>.36 (.11)</td>
<td>.66 (.19)</td>
<td>.46 (.15)</td>
<td>F(2, 1025) = 4.87, $p &lt; .01$</td>
</tr>
<tr>
<td>H3: Privacy concerns</td>
<td>4.46 (.11)</td>
<td>4.31 (.13)</td>
<td>3.87 (.12)</td>
<td>F(2, 864) = 58.34, $p &lt; .001$</td>
</tr>
</tbody>
</table>

Note: Significant differences in least squares means are indicated by a different superscript within rows.

To test global effects of the privacy boundary on self-disclosure goals as predicted in H2, we ran a mixed-effects multinomial logit model using SAS GLIMMIX because self-disclosure goals were coded as a variable with seven unordered categories. A multinomial logit model with boundary type as a predictor and self-disclosure goals as a response was used to determine whether the predictor had an effect on the probability distribution of the response (So & Kuhfeld, 1995). To achieve model convergence, the two goal categories appearing least frequently (“identity clarification” and “storage and entertainment”) were excluded from analysis. The analysis concluded that there was a significant effect of privacy boundaries, $F(8, 925) = 3.24$, $p < .01$, supporting the claim that disclosure goals were different over the three types of boundaries.

Because we predicted fewer relational development and more social validation goals in public Twitter accounts, we followed up the multinomial analyses with a mixed-effects binary logit analysis. The relational development and social validation goal categories were treated as separate dichotomous variables, depending on whether the goal was present or absent for each instance of self-disclosure. For relational goals, there was a significant effect of boundary type even after controlling for message length, $p < .001$, $r_{BESD} = .12$, with Facebook having the highest probability of a relational goal, followed by protected Twitter, and then public Twitter (see Table 4). The odds of having a relational goal were 2.58 times higher in Facebook than in public Twitter, and 1.45 times higher in protected Twitter than in public Twitter.

A significant effect of privacy boundary was also found for social validation goals, $p < .01$, $r_{BESD} = .10$, with public Twitter having the highest probability of a social validation goal, followed by protected Twitter, and Facebook (see Table 4). The odds of having a validation goal in Facebook was 0.54 times the odds of having a validation goal in public Twitter, and the odds of having a validation goal in protected Twitter was 0.69 times the odds of having a validation goal in public Twitter. However, the only significant difference was between Facebook and public Twitter, $t(1025) = −3.01$, $p < .01$. The differences between Facebook and protected Twitter, $t(1025) = −1.43$, and between public and protected Twitter $t(678) = −1.56$, were not significant. Thus, H2a was supported, and H2b was supported for relational goals only. The effect of privacy boundary was not significant for all other self-disclosure goals, $p > .05$.

Next, H3 analyzed the effect of privacy boundaries on privacy concerns. The ICC for this model was .2234, indicating 22.34% of the total variance in privacy concerns was accounted for by differences between participants. Results showed that there was a significant effect of privacy boundary type, $p < .001$, $\eta^2 = .14$, with participants having the highest privacy concerns in Facebook, followed by public Twitter, and then by protected Twitter (see Table 4). Contrary to H3a, privacy concerns were not significantly different between Facebook and public Twitter, but in support of H3b, privacy concerns were higher on public Twitter than on protected Twitter. We further controlled for self-disclosure intimacy in analyzing privacy concerns to see if the higher message intimacy in Facebook was driving the increased privacy concerns. While the effect of intimacy was significant, $F(1, 785) = 8.39$, $p < .01$, the boundary type still significantly
influenced privacy concerns, \( F(2, 785) = 58.81, p < .001 \), with people reporting most privacy concerns on Facebook.

Finally, we ran an analysis to test the association between self-disclosure goals and self-disclosure intimacy (H4), with results summarized in Table 2. Privacy boundaries, \( F(2, 729) = 25.09, p < .001 \), and self-disclosure goals, \( F(6, 729) = 9.99, p < .001 \), had a significant effect on self-disclosure intimacy, \( \eta^2 = .16 \). Overall, self-disclosures with the relational development goal had the highest intimacy, and these were significantly higher in intimacy than disclosures with the social validation goal, \( t(729) = 6.98, p < .001 \).

### The effect of network characteristics

Next, H5 and H6 predicted an interactive effect between the two types of audience representations, as seen in privacy boundaries and network characteristics (e.g., size and diversity), on self-disclosure intimacy. Specifically, we expected a greater effect of network characteristics in Facebook and protected Twitter accounts, as they have less permeable and more clearly defined boundaries compared with public Twitter accounts. The ICC for these models was .3417, indicating that 34.17% of the total variance in self-disclosure intimacy was accounted for by differences between participants. In partial support of H5, the interaction between privacy boundary and network size was significant, \( F(2, 782) = 3.10, p < .05, \eta^2 = .09 \); however, the differences in slopes between public Twitter and Facebook were not significant, \( t(781) = 0.43, p = .66 \), whereas the differences in slopes between public and protected Twitter were \( t(781) = -1.89, p < .05 \). To facilitate the interpretation, the interaction was plotted using Soper’s (2014) interaction analysis program (see Figure 1). As can be seen on the plot, the slopes are different between public and protected Twitter, whereas the slopes do not differ much between public Twitter and Facebook. This is in support of H5b only as the effect of network size has a greater effect in protected Twitter accounts. Next, H6a and H6b looked at the interaction between privacy boundary and network diversity. The interaction was significant, \( F(2, 782) = 3.22, p < .05, \eta^2 = .09 \), but differences in slopes between public and protected Twitter were found to be not significant, \( t(781) = 0.82, p = .41 \), whereas differences in slopes between public Twitter and Facebook were significant, \( t(781) = 2.46, p < .05 \). Further investigation of interaction plots (see Figure 2) shows similar trends in that slopes differ between public and protected Twitter, but not between Facebook and public Twitter. Thus, only H6b was supported.

### Discussion

Drawing on the concept of audience representations as seen in privacy boundary type and network characteristics, this study examined self-disclosure and privacy differences between Facebook and Twitter. While the privacy boundary type reflects information access for people outside the collective boundary, network characteristics provide cues for audiences within the boundary. The results point out the complexity of privacy regulation in social media environments in which collective boundaries...
around private information play a key role in self-disclosure intimacy, privacy concerns, and self-disclosure motivations for each SNS.

Theoretical implications

Privacy boundaries and self-disclosure

In this study, we conceptualized SNSs as a collective information management system in which people jointly co-own information (Petronio, 2002). Characteristics of the privacy boundary around this collective determine the ease of access to personal information for audiences outside the boundary and should shape perceptions of audiences as being bounded versus unbounded. The results show a consistent effect of privacy boundaries on self-disclosure intimacy, self-disclosure goals, and privacy concerns, although not all results were in the predicted directions. Overall, people self-disclosed more intimate content on Facebook than on Twitter, but there were no differences in self-disclosure intimacy between protected and public Twitter. Privacy concerns varied across these channels, with people being most concerned about their
privacy on Facebook, followed by public Twitter, and then protected Twitter. Thus, in comparison to public Twitter, people had both highest privacy concerns and highest self-disclosure intimacy on Facebook. To see if higher intimacy of messages in Facebook was driving increases in privacy concerns, we further controlled for message intimacy in the analysis of privacy concerns, which did not change the significance or the direction of the results.

The discrepancy between privacy attitudes and self-disclosure behaviors on Facebook, as suggested by the above findings, is consistent with earlier research on the privacy paradox phenomenon, which found a gap between privacy attitudes and behaviors, in that privacy concerns did not always translate into more cautious self-disclosure behaviors in social media (Acquisti & Gross, 2006). What is interesting is that we see this paradox present on Facebook, but not on Twitter, where people have less privacy concerns and share less intimate disclosure, compared with Facebook. The privacy paradox as a Facebook-specific phenomenon suggests a greater

**Figure 2** Privacy boundary and network diversity interaction effect on self-disclosure intimacy.
challenge of privacy boundary coordination on Facebook. Compared with public Twitter, both Facebook and protected Twitter have boundaries that are more clearly defined in ownership, less permeable, and less prone to linkage. However, there are also some important differences between Facebook and protected Twitter accounts. On Facebook, a self-disclosure initially restricted to a profile owner’s network of friends can become easily accessible to other networks when friends comment on the profile owner’s posts. Thus, Facebook content can be redistributed outside the original boundary without the discloser’s permission. This creates “invisible audiences” (boyd, 2008) that include people who were not intended by the original discloser to co-own this information.

This relates closely to the CPM theory concept of boundary turbulence, which refers to disruptions in boundary management processes due to a misalignment between boundary ownership, linkage, and permeability (Petronio, 2002). Consequently, although Facebook affords clearly defined boundary ownership by granting profile owners a right to admit people as friends into their network, this ownership comes with relatively permeable and linkage-prone boundaries, which can lead to a higher likelihood of boundary turbulence. This underscores the tension between Facebook’s philosophy of maximum openness and linkage, and users’ concerns for privacy and control. This may also be partly responsible for challenges of boundary coordination on Facebook, which results in a discrepancy between high privacy concerns and high intimacy disclosures as seen in the privacy paradox (Acquisti & Gross, 2006).

By contrast, owners of protected Twitter accounts are granted a tighter control over their boundaries as tweets are visible only to approved followers, other users are not able to retweet the discloser’s tweets, and @-replies sent to other Twitter users cannot be seen by people who do not follow the account. Thus, owners of protected Twitter accounts have a more clearly defined privacy boundary compared with Facebook users, and the alignment between clearly defined ownership and low boundary permeability facilitates boundary regulation.

Similarly, there is a closer alignment between boundary permeability and ownership in public Twitter accounts such that ambiguously defined ownership is coupled with high boundary permeability (e.g., retweets and hashtags make it easy for the information to spread to third parties). This alignment and transparency about third-party access on public Twitter also suggests an alternative explanation for users’ low privacy concerns, in that when one uses a public Twitter account, any aware user should simply not be concerned about privacy; anyone concerned about privacy simply does not understand how public Twitter accounts work.

**Self-disclosure goals and intimacy**

Extending the functional model of self-disclosure on Facebook (Bazarova & Choi, 2014) to multiple media, we found differences in self-disclosure goals between Facebook, public Twitter, and protected Twitter. In particular, there were more self-disclosures motivated by relational development goals in SNSs with more clearly
defined privacy boundaries (e.g., Facebook and protected Twitter) compared with public Twitter. This finding highlights the role of an SNS’s structure in pursuing relational management through self-disclosures on SNSs such that people may feel more comfortable pursuing relational goals in channels with more clearly defined boundaries than those with loosely defined boundaries and potentially unbounded audiences. Because self-disclosures motivated by a relational development goal were the most intimate in nature, people may not want to share them in a publicly accessible space such as public Twitter. Consistent with this, our findings show more intimate self-disclosures on Facebook compared with those on public Twitter.

On the other hand, disclosures motivated by the social validation goal were more likely to occur in public Twitter accounts than in Facebook, but there were no differences in their occurrence between public and protected Twitter accounts. Prior studies have characterized one popular use of Twitter as a tool for self-promotion, building a personal brand, and strategic self-commodification (Marwick & boyd, 2011), which encourages performative expression and “storytelling of the self” (Papacharissi, 2012). These attributes are in line with seeking a form of social validation from others.

The finding about social validation goals being equally prominent in public and protected Twitter suggests that factors other than privacy boundary drive this goal on Twitter. These factors may include site norms or Twitter’s distinctive characteristics, such as brevity of content and high interconnectedness, which make it part of a class of communication channels characterized as “social awareness streams” (Naaman et al., 2010). Furthermore, the salience of social validation goals in protected Twitter may help explain the lack of differences in self-disclosure intimacy between protected and public Twitter accounts, as social validation goals were generally associated with lower intimacy of self-disclosure compared with other goals.

Interplay between the two types of audience representations

Finally, we predicted that network characteristics should exert greater influence on channels with clearly defined privacy boundaries (e.g., Facebook and protected Twitter) than on channels with loosely defined privacy boundaries (e.g., public Twitter). Indeed, we found interactive effects between the two audience representations as captured by privacy boundaries and network characteristics, which partially support our claims about how network characteristics may matter less in open boundaries. The interaction between privacy boundary and network size showed that changes in network size had a greater effect in Facebook and protected Twitter, whereas it did not affect public Twitter much. Thus, there is evidence to suggest that privacy boundaries do not override the effects of one’s own network, but rather work in tandem with network characteristics.

One thing to note is that network size influenced self-disclosure intimacy in opposite directions, in that self-disclosure intimacy increased with larger Facebook networks, and decreased for larger protected Twitter networks. The opposite trends between Facebook and protected Twitter suggest that changes in network properties highlight anticipated benefits and risks of self-disclosure differently on Facebook.
than on protected Twitter. As both the risks and benefits can rise with network size, it is possible that higher self-disclosure intimacy reduces social distance and helps build social capital in large Facebook networks, but lower self-disclosure intimacy protects privacy in the face of a large network on protected Twitter.

The interaction effects between privacy boundary type and network diversity were also not in the expected directions. Rather, changes in network diversity had the least influence in protected Twitter, but had large effects in both Facebook and public Twitter, in that increases in network diversity led to increases in self-disclosure intimacy for both. This may again point to the use of self-disclosure for building social capital on Facebook and public Twitter (Ellison, Vitak, Steinfield, Gray, & Lampe, 2011), as network diversity increases social capital by providing access to different groups of people. Overall, these results point to the need to study the effects of network characteristics in connection to media properties and affordances to better understand self-disclosure and other social behaviors in social media.

Future directions
While our approach of considering privacy boundaries as a cue to audience representations drew on the functional model of self-disclosure (Bazarova & Choi, 2014), future research needs to consider intersections between the model and other theories of media and technology use. This research will be especially relevant when attempting to gather a broader understanding of self-disclosure in communication through different technologies. Also, whereas this study attempted to examine self-disclosure behavior across multiple platforms, Facebook and Twitter are only a small subset of frequently used SNSs (Duggan & Smith, 2013), and a more comprehensive investigation of self-disclosure needs to encompass multiple technologies and media, such as cell phones, instant messaging, and e-mail (Kim, Kim, Park, & Rice, 2007).

Furthermore, future work will need to investigate active boundary regulation processes in relation to multiple SNSs. While we considered medium privacy boundaries to be a relatively stable presence that come in the form of audience representations, others have identified active strategies people use to regulate and shape their own boundaries, such as self-censorship (Stutzman & Kramer-Duffield, 2010), selectively choosing to make self-disclosures available to certain feeds (Walton & Rice, 2013), and removing content that has been previously disclosed (Child, Petronio, Agyeman-Budu, & Westermann, 2011). Extending this work into the context of multiple SNSs would prove useful. Another active boundary regulation strategy that needs to be investigated is the use of message-level privacy settings (e.g., custom friend lists in Facebook) for finer control of privacy boundaries. A recent study has found that people tend to disclose more information when they perceive themselves as having more control over the distribution of information (Brandimarte, Acquisti, & Loewenstein, 2013). Although we partly considered information ownership and control in terms of different privacy boundaries, a study that incorporates more explicit conceptualizations of control over private information and self-disclosures will help to further the understanding of privacy boundary management.
Limitations

Some limitations of this study arise from the participant sample population. Because this study recruited only a relatively small sample of college students, the results have limited generalizability to other populations, such as adolescents or older adults who may be using Facebook and Twitter in different ways. The sample was also skewed in terms of gender, with the majority of the sample being female. However, when gender was controlled for in analyses, it did not have a significant effect on any of the results.

Also, the study considered only the messages that were addressed to the participants’ entire network. The number of messages that used more sophisticated privacy settings, such as the custom lists feature of Facebook, was too small (5% of all messages) to make comparisons with network-visible Facebook communication. However, people still may be actively using message-level privacy settings to limit which parts of their network has access to their disclosures. Looking at these messages can provide a comparison parallel to messages posted on public versus protected Twitter accounts, in that people are opting for even more restricted privacy boundaries on Facebook.

This study also did not directly measure audience perceptions as captured by the privacy boundary of a communication channel. Because user audience expectations may not always match existing privacy settings of an SNS (Liu, Gummadi, Krishnamurthy, & Mislove, 2011), a more direct measurement of privacy boundary permeability, ownership, and linkage and examination of their effects on self-disclosure and privacy on SNSs would be an important task for future research. Finally, given that the data collected were cross-sectional in nature, only correlational results can be inferred from the study.

Conclusion

The opportunities brought by new technologies to share personal information with others come with new challenges for privacy coordination. One of the challenges has to do with knowing one’s audience in social media, and this study examined the role of SNSs’ structures and audience cues in shaping disclosure goals, intimacy, and privacy concerns. In a world where the latest trends in communication technology are changing at such a rapid pace, considering fundamental influences that span across many SNS settings is important. Extending the functional model of self-disclosure in an approach informed by CPM theory, this study attempted to pave the way for such investigations.

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References


Extending the Functional Model to Multiple SNS

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Utz, S. (2014, May). *Self-disclosure on social networking sites: Intimate, but also entertaining self-disclosure increases the feeling of connection*. Paper presented at the 64th ICA Annual Conference, Seattle, WA.

