We're in It Together: Interpersonal Management of Disclosure in Social Network Services

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ABSTRACT

The workload needed for managing privacy and publicness in current social network services (SNSs) is placed on individuals, yet people have few means to control what others disclose about them. This paper considers SNS-users' concerns in relation to online disclosure and the ways in which they cope with these both individually and collaboratively. While previous work has focused mainly on individual coping strategies, our findings from a qualitative study with 27 participants suggest that collaborative strategies in boundary regulation are of additional importance. We present a framework of strategies for boundary regulation that informs both theoretical work and design practice related to management of disclosure in SNSs. The framework considers disclosure as an interpersonal process of boundary regulation, in which people are dependent on what others choose to disclose about them. The paper concludes by proposing design solutions supportive of collaborative and preventive strategies in boundary regulation that facilitate the management of disclosure online.

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INTRODUCTION
While social media are all about sharing content with a community, few people wish to share everything with everyone all the time. In making decisions about what to

disclose and when, individuals often struggle to reconcile opposing goals such as openness and autonomy [11]. In social network services (SNSs), such as Facebook, users balance between making some content public and keeping other things more private. Following Altman [3, 4], we refer to this as *boundary regulation of privacy and publicness*. As interaction in SNSs mixes audiences, successful privacy management demands that SNS-users handle a multiplicity of interaction partners. In practice, this means that privacy management processes online are different from those applied in face-to-face interaction [16], since SNS-users need strategies to cope with, for instance, the simultaneous presence of multiple groups that are important to them [6, 13].

Managing disclosure is a concern for individuals when they wish to maintain *a self-presentation* – that is, to present themselves as certain kinds of persons to be treated in a certain way [10]. The possibilities for strategic self-presentation are manifold online. More recently, it has been argued that people have more control over impressions they give to others online than they have in offline settings, since they can decide what to reveal, omit, embellish, or underplay [21].

However, while users of SNSs are free to decide what they share, they often cannot control the content others disclose about them. For example, difficulties in managing the spread of uploaded photos are commonly referred to as a current challenge. Or one might consider another typical example illustrating the everyday challenges in using SNSs: the break-up of a couple. No matter how carefully you try to hide a new relationship from your jealous ex-partner, your Facebook friends may inadvertently challenge these efforts by posting comments on how happy they are for you and, thus, reveal your relationship status to others.

In their discussion of privacy in a networked world, Palen and Dourish [17] pointed out problems emerging from limitations of control over participation and identity definition in online contexts, such as the difficulty of controlling what a Google search reveals of oneself. This paper takes a further look at the management of privacy and publicness as an interpersonal process in the specific

domain of SNSs. We investigate what kind of interpersonal boundary regulation concerns users of SNSs have and what kinds of strategies they apply to cope with them in SNSs. We consider how individuals manage not only their own privacy and publicness but also that of their peers.

Achieving full control over disclosure in SNSs is impossible for an individual, much as in other everyday contexts. Yet it is worth noting that interactions in SNSs differ from face-to-face settings in their persistence, replicability, scalability, and searchability [7]. These aspects emphasize the importance of questions of control, since instead of being fleeting and offering the possibility to forget, interactions in SNSs leave enduring traces.

Current tools for managing disclosure in SNSs tend to disregard the interdependence inherent in managing privacy and publicness. Therefore, they do a poor job in supporting collaborative boundary regulation. For instance, there are no easy means for a group of SNS-users to collaboratively negotiate the suitability of a photo for disclosure before actually disclosing it. As a consequence, SNS-users must either find workarounds or make decisions on their own. Hence, they try to tackle individually challenges that are, in fact, beyond their sole personal control. Previous research, too, has emphasized mostly individual efforts in balancing disclosure (for an exception, see [20]).

We explore SNS-users' perceptions of control over online disclosure on the basis of a qualitative study consisting of, in all, 24 individual interviews and five focus groups. We analyze how the participants discussed interdependence in boundary management in SNSs. Our results show that SNS-users manage interpersonal boundaries both individually and collaboratively. Besides highlighting the role of collaborative management of disclosure, we contribute to online privacy research by providing a framework that both systematizes and extends the explanations identified in recent work on privacy concerns related to interpersonal boundary regulation [2, 5, 14, 24].

We conclude that both SNS-users and service providers could benefit if SNSs were to introduce tools to support collaborative, preventive strategies for managing disclosure. Furthermore, we invite designers to take a fresh look at the design space depicted by our framework. As an example we outline a design solution that acknowledges the multidimensionality of boundary regulation. The proposed framework helps to further both theoretical and design work on interpersonal management of disclosure in SNSs. Also, it simplifies identification of which types of boundary regulation strategies are supported by certain designs and which are not.

RELATED LITERATURE
From the vast body of literature available on privacy and publicness in SNSs, we focus on approaches that empirically study how individuals manage their privacy and publicness in computer-mediated interaction. Our work continues the stream of research based on Altman's [3, 4] theory on interpersonal boundary regulation. Altman understands privacy to be a process of interpersonal boundary control that paces and controls interaction. Both inputs and outputs in interaction are regulated, and this regulation is done in order to achieve the desired level of privacy, which might differ from the one that is actually achieved. Studying boundary regulation in computer-mediated communication, Palen and Dourish [17] have named disclosure, identity, and temporality as three boundaries that are central to privacy management. These boundaries involve privacy–publicity balancing, management of self-presentation, and the sequence disclosures form over time.

Besmer and Richter Lipford [5] claim that the main issue in boundary regulation is the negotiation over ownership of content. Squicciarini, Shehab, and Paci [20] discuss collaborative privacy management in a game-theoretical study that considers online sharing through the lens of the concept of co-ownership. To differentiate the content shared among end users according to who has control over the data, we apply the concepts of disclosed, entrusted, and incidental data, as coined by Schneier [19]. "*Disclosed data*" refers to the data that end users post themselves for others to see; "*entrusted data*" to the information posted on pages managed by others, including comments, photos, etc.; and "*incidental data*" to the data other users post about the user.

In SNSs, privacy concerns are more than before related to second parties – that is, to people who are known also offline and who are anything but faceless. According to recent findings, younger people emphasize this kind of privacy, an inherently "social" privacy [18]. For example, survey results concerning privacy on Facebook highlight that youth do care about privacy and show how modifications to privacy settings increased over a year during which privacy policies were debated heatedly [8]. However, as Acquisti and Gross [1] have shown, SNS-users' privacy concerns are not necessarily reflected in their actions, partly since privacy-related misconceptions are common.

There seem to be relatively few tangible confrontations actually occurring for individuals, but people nevertheless adopt various and sometimes conflicting strategies for boundary regulation [14]. The body of research on strategies for boundary regulation has recently grown rapidly (see, for instance, [2, 5, 12, 13, 14, 16, 23, 24]). Yet, to our knowledge, little synthesis work has been done so far. We review selected research with the aim of building a summarizing framework, because space constraints render a complete review beyond the scope of this paper.

Lampinen et al. [13] considered challenges that co-presence of multiple personally important groups poses to the boundary regulation efforts of an SNS-user. Users were found to apply both behavioral and mental strategies to manage this co-presence, even in the absence of technical tools for fine-grained sharing. *Behavioral strategies* consisted of dividing the platform into separate spaces, choosing suitable communication channels, and performing

self-censorship. *Mental strategies* included both the creation of more inclusive in-group identities and the reciprocity of trusting other users along with a mindset emphasizing the importance of being responsible.

Kramer-Duffield [12] found that students combat the collapse of contexts in SNSs by segregating interaction with different audiences to different communication media. Stutzman and Harzog [23] have reported similar boundary regulation methods: having two or more profiles on one site, using privacy mechanisms to create functionally different audience zones, and using different social media tools for different audiences. Lehmuskallio's [14] study of photo sharing revealed a number of privacy management strategies, including choosing Web services that seem trustworthy, avoiding the uploading of potentially problematic pictures, not sharing pictures publicly, allowing access only for specific people, and applying rules of thumb for what photos to share. We categorize all of these as *preventive strategies* – that is, as actions pursued with the aim of avoiding potential unwanted outcomes in the future.

Stutzman and Kramer-Duffield [24] discuss interpersonal privacy management while focusing on another preventive strategy for managing privacy and publicness: the practice of making one's profile private and, thus, viewable only for articulated connections. Besmer and Richter Lipford [5] mention more fine-grained strategies, such as changing one's behavior both online and offline in order to cope with the use and popularity of Facebook photo sharing. These strategies include untagging photos, using other online sharing methods to limit accessibility, and negotiating offline the removal of unwanted photos. Next to the aforementioned, some users changed their everyday behavior to prevent unwanted photos from being taken at all. Untagging and negotiations to remove unwanted content are examples of *corrective strategies*. By "corrective strategies," we refer to actions directed toward a particular, concrete "threat" – that is, actions taken to minimize or erase effects that are considered negative.

THE STUDY
To analyze perceptions and strategies of interpersonal boundary regulation in SNSs, we conducted a set of qualitative interviews among university students at a multidisciplinary institution in the Helsinki metropolitan area, in Finland. The study is part of a wider research project that develops and studies new social media services.

Research methodology
A qualitative approach was chosen in order to explore possibly novel ways of interpersonal management of disclosure in SNSs. The research material was collected in three phases during the 2009–2010 academic year. Both semi-structured individual interviews and focus groups were used to capture participants' viewpoints on, and the controversies related to, boundary regulation. Instead of longitudinal analysis, our aim is illumination of the variety of interpretations regarding the phenomena in question. First, two rounds of individual interviews were conducted to analyze participants' personal experiences related to

publicizing content, their explicit strategies for boundary regulation, and the reasoning behind these. They covered participants' background in using SNSs, too.

Second, since the differing interpretations and the controversies related to boundary regulation easily remain implicit, we triggered debate on them in the focus groups. We probed the discussion with explicitly provocative claims, such as "*My friends act in social network services with consideration and take my wishes into account*", and examples of possible boundary-challenging situations. The probes were created on the basis of the concerns about interpersonal boundary regulation that we identified from the individual interviews as well as drawn from cases covered in the press or informally reported to us. The example situations, such as an ex-partner commenting bitterly on a status update about traveling with a new partner, allowed the participants to reflect further on possible behaviors in situations they had not necessarily faced themselves. After each claim or example, the participants discussed how they understood them, and what they thought about them. For a discussion about using probes in focus groups, see [9].

In total, 27 people participated in the study. They were from two different groups: undergraduates in technology studies and graduate students of industrial arts and design. Most participants from the graduate program were international students. They represented a prominent age group in SNSs (according to statistics on American SNS-users [15]), being in their early 20s and early 30s. The gender distribution had a slight male bias, with 17 males. The participants were active on Facebook and in other SNSs to differing degrees, but all had used them regularly enough to have experience of publicizing content. Furthermore, the international students interviewed used SNSs specific to their countries of origin.

The first phase of the study consisted of 11 and the second of 13 individual interviews. After these, five focus groups were organized, with 18 participants in all. Six persons took part in all three phases. Both the individual interviews and the focus groups lasted a maximum of an hour each. As an incentive for participation, each of the participants received a movie ticket for each interview in which he or she participated. In the interview excerpts presented below, the participants (P X) and, in the case of group interviews, groups (G Y) are identified by numbers (in place of "X" and "Y," respectively), which are allocated in the order of the first appearance of an individual or group in the text.

Analysis
Since the purpose of our work was to both systematize and deepen the understanding of interpersonal disclosure management, as implied in previous research presented above, we focused especially on 1) concerns related to and 2) strategies for interpersonal boundary regulation.

Once the interviews were transcribed, two of the authors began the analysis by open-coding concerns related to

interpersonal boundary regulation with a grounded theory approach [22]. Because we were already informed by related research, especially [2, 5, 14, 24], key findings from these prior studies served as loose interpretative anchors in the later phases of the analysis. First, we noticed an expectation of mutual mindfulness of others' self-presentation. We explored this further and identified concerns related to fractures in this expectation, which may result from group co-presence, temporal persistence, and oneself revealing too much about others. The strategies, for their part, were classified according to categories derived from prior research – 1) *preventive* and *corrective strategies* and 2) *mental* and *behavioral strategies* – in conjunction with our extension to them: 3) *individual* and *collaborative strategies*. The content of these categories and their subcategories is elaborated upon below.

PRIVACY CONCERNS AND MUTUAL CONSIDERATION

SNSs that boost the persistence, replicability, scalability, and searchability of user actions make many types of boundary violations possible. Varied concerns related to management of privacy have been identified in previous studies [2, 6, 14]. Below, we take a closer look at concerns related to others revealing too much about one's life as well as, notably, one revealing too much about others.

All interviewees felt that it was or would be burdensome to control disclosure on Facebook or in other SNSs very rigorously, but they differed in their willingness to invest effort in managing privacy and publicness. However, all participants cut themselves slack from striving for control sometimes, choosing to rely on others instead. Willingness to rely on trust was based on an assumption that one's friends in an SNS know how to behave:

[M]y friends at least have a sufficiently normal mindset [...] it is important to be polite, be considerate, and take others into account in everyday life, too; that applies similarly on Facebook. Male, Participant 1, Group 1

Trusting others to be considerate of one's boundary regulation efforts, and being trustworthy in return, is an example of a mental coping strategy. While it can be used as a guide to what kind of action to undertake, it is foremost a mindset that reassures that there is no need to try to control the situation forcefully. Our participants expected behavior that respects the boundaries they are trying to manage, and they described the efforts they made to be trustworthy in return:

I have a principle that if I upload photos, I won't upload the kind of material of others that I would not want to post of myself, too. Male, P 2, G 2

Our participants talked about considering how publicized content will be interpreted and by whom. Also they gave examples of pondering upon sharing of content that could challenge a boundary others are trying to manage:

I didn't know this person well enough to want to post there a comment like, "Hey, please tell me what has happened,"

because I saw that many people who are close to the person already knew and I didn't – so then I thought "I'm not going to put my nose into it, because I'm not so close with that person and it has obviously been something very serious." Female, P 3, G 3

Expectations of mutual consideration came up especially often when the participants were presented with examples of situations where one person challenged the boundary regulation efforts of another. For instance, an example situation of somebody commenting "*Why wasn't I invited?*" in a thread of posts of thanks for a party, and bitter comments posted by an ex-partner, provoked incredulous laughter. We interpret this reaction to reflect a view that violating others' trust calls into question not only the boundaries others were trying to regulate but also one's own reputation.

The interviewees considered the incidents depicted to be more telling of the person making norm-breaking posts than of the one at whom they were targeted. It was hard for the interviewees to imagine that their friends or family would ever cause such scenes. One of the interviewees explained that his group of friends would not accept such behavior:

[I]f someone in our friend group would start to misbehave, he'd probably get direct feedback quickly, on some level, because it just isn't OK, but that is quite clear, in my opinion. Male, P 4, G 2

Participants took almost for granted that sharing online is based on trust in others' collaboration in managing the boundaries of privacy and publicness – a shared norm of privacy boundary regulation online. Overall, this was the baseline that made sharing content in SNSs feasible. Placing others' trust at risk seemed almost unimaginable and fully unacceptable. Also, the participants were certain that others would not draw serious conclusions about them if, against expectations, something self-presentation-questioning did happen. They did not worry much about anyone fracturing their boundaries on purpose.

However, the participants were concerned about whether others, and they themselves, would succeed in living up to these expectations of trustworthiness. Being considerate in mediated contexts, where multiple audiences are likely to be present even if not visible in an obvious way, is a challenge. It may be hard or even impossible for an individual to understand the fine-tuned boundaries within the network of another. Despite efforts to be attentive of others' boundary regulation, failures occur. As one of our participants put it:

I know that people don't want to be annoying, but completely random things happen. Female, P 5

Sometimes it happens that a good friend posts a status update, maybe not with your name on it but in a way that it's clear it's about you -- and then you feel that maybe it wasn't necessary to post that. Yet you don't bother to ask [the person] to delete it, 'cause it's not that personal.

Because of this, the friend might not know that you don't like the post, and thinks that it's how you wish it to be. Male, P 6, G 4

Fractures in boundary management reveal its interpersonal character. As presented by Lehmuskallio [14], regulating boundaries is an interpersonal pursuit, for successful regulation can be challenged by something others publicize.

Concerns are often related to the co-presence of social circles, such as different cultures and generations that lack shared norms for communication and interpretation. A participant described his experiences of a cultural clash between the student culture in his current country of residence and the expectations of his relatives in his home country, both of whom see pictures about him on Facebook:

[F]or example, even having a beer with friends is not considered appropriate in a lot of situations. In some cases, all students were sitting in the student restaurant and having a beer and people were taking pictures and they just posted that "we had a nice evening." Some of my friends or cousins expressed having seen them when we talked over Skype. Although it didn't become a big issue during our conversation, I was aware that it's breaking cultural boundaries. Male, P 7

An individual may be aware of the conflicting viewpoints of two different audiences and use the features of the service to regulate the boundaries between the circles that know different things about the individual: "*I had to erase some pictures when I got some new people as friends* [on Facebook]." (female, P 8).

The worry of revealing something about others seems as weighty as the concern of others revealing something about oneself. Our participants expressed a need to be careful, for instance, when commenting on a status update. However, it can be difficult to know how to be careful. Below, a participant explains how she had not thought that there could be any harm in congratulating a friend on getting accepted to a master's degree program but, by so doing, inadvertently almost caused the friend a difficult situation:

He quickly removed the comment from there and was like "Sorry I removed your comment, but I haven't told my boss yet. I don't want him to see this yet!" Female, P 10, G 3

The problem is that SNS-users rarely know all members of their friends' networks and therefore may be unaware of how and with what implications other people will interpret their comments or the content they share about others.

STRATEGIES FOR BOUNDARY REGULATION
Users of SNSs apply varied strategies for boundary regulation in order to cope with the concerns presented above. We now consider different preventive and corrective strategies. These categories include mental as well as behavioral strategies.

Our analysis shows that the individual endeavors for balancing privacy and publicness as depicted in previous literature are intertwined with collaborative strategies of negotiating boundaries (for an earlier, brief discussion of interpersonal privacy management, see [24]. Since this has not been highlighted in previous work, we wish to underscore it explicitly with the following quote:

[I]n a way, the certain threshold that friends have for posting photos is the baseline, and beyond that, you have to master your own privacy. Male, P 4, G 2

Here the interviewee explains that friends set the baseline of what is shared but how beyond that, it is up to oneself to take care of boundary regulation.

Preventive strategies
Participants apply a range of preventive strategies for balancing privacy and publicness, to avoid causing problematic situations for themselves or others. These strategies are part of everyday boundary regulation. Their purpose is to prevent boundary regulation from breaking down. In other words, the strategies are aimed at keeping SNS-users from losing face in front of others [10].

Targeted sharing with different audiences
When people decide to share something on a social network site, they need to consider who should be able to see the content in question. There are multiple ways of controlling this, ranging from sending private messages instead of public ones to creating separate audience zones by means of privacy settings or the use of multiple accounts in one or multiple services. Participants' preventive strategies include *sharing content groupwise* by using profiles in multiple services and categorizing their networks into groups within a service with the help of privacy settings as well as by sending private messages.

Previous research has shown that sharing content groupwise can be realized in a number of ways [23]: using profiles in multiple services, using multiple profiles in one service, or using privacy mechanisms to create functionally different audience zones within one profile. In our sample, a couple of individuals were *using profiles in different services* to target different audiences. One international student used an SNS from her country of origin, and one student limited business contacts to LinkedIn instead of accepting them as friends in Facebook. Eight participants said that they had applied privacy mechanisms to establish different audience zones within Facebook. None of our participants had multiple accounts in one service. Some mentioned sending private messages within Facebook as a way to target sharing to specific people.

In the case of use of multiple services, the strategy allowed sharing one set of content with friends and family in the native country and another set of content with friends and acquaintances in the current country of residence. As another example, profiles in multiple services were used to distinguish business contacts, such as potential employers, from personal contacts, such as friends and family.

However, using privacy settings within a service to create different audience zones was a more common strategy for keeping different audiences separate from one another. Some of Facebook's current features support groupwise sharing. Facebook-users can create static rules of who has access to what types of data, or they can limit access to specific content case by case. *Categorizing one's network into suitable groups* was seen as involving effort, and some of the interviewees had not yet done so, even though they considered it to be a useful strategy.

The participants used privacy settings to limit the spread of content shared by both themselves and others. Some managed their group-specific sharing by separating audiences from different contexts from one another – for instance, sharing certain things with their friends at the university, others with work-related contacts, and yet other things with their relatives. Others found it more effective to define broad categories based on how close they were with different people – i.e., sharing content on the basis of proximity categories. For the latter, grouping Facebook friends according to social circles did not seem helpful, since the differences in closeness were larger within categories than between them:

Well, I thought about that, but then I did it according to what I want different people to see. For example, I have friends from hobbies and some of them get to see more of my information while others are not close at all, so I couldn't do it on the basis of groups, so then I organized it by who gets to see what. Female, P 11, G 2

Finally, even when something is made technically public, the effective "informative value" of a posting can be differentiated for different groups of people. Participants reported doing this by choosing *wordings and tones* that would not open up similarly to everyone.

These preventive strategies gave individuals a sense of control over who can access content concerning them. We conclude that these *individual, behavioral* strategies were valued partly since they helped control the availability of incidental data to the mixed audiences with access to one's profile. While these individual strategies were central to boundary regulation, they do not cover the whole story of preventive boundary regulation strategies.

Deciding not to publish and collaborative negotiation
The first step in the process of online disclosure is to choose whether something will be shared at all. *Avoiding publicizing content that could be problematic*, either for the person him- or herself or for others, is an important preventive strategy for avoiding conflicts. Participants anticipated the effects of publicizing content and simply avoided posting what could be problematic or inappropriate according to their own criteria:

When you upload photos with friends in them, you check that the picture is OK and you don't post any pictures that are completely out of line. Male, P 12, G 1

While participants, consciously or unconsciously, maintain a personally acceptable impression of themselves, they are doing the same for others. Considerations of what to share can be interpreted as a means to build reciprocal trust by showing respect for another person's self-presentation online. However, technical tools in SNSs do not offer means to show that such consideration has taken place. Individuals ponder the appropriateness of publicizing content related to others, as illustrated in the example above. When this is found too burdensome, a popular strategy for playing it safe and maintaining one's trustworthiness is to withdraw from publicizing at all.

To avoid considering every click of the "Share" button case by case, participants relied on an understanding of acceptable behavior. *Rules of thumb* are conventions that facilitate decision-making regarding disclosure. They may be *individual, mental* decision rules or implicit expectations of shared understanding. Interestingly, many participants had never negotiated or even discussed shared rules of disclosure with their friends but, nevertheless, expected them to know how to act in SNSs. The following example illustrates how strongly an interviewee trusted in his Facebook friends, given that he has difficulties even imagining that anyone would do something that would bother him. Furthermore, he relies also on the availability of collaboration in applying corrective strategies, if need be:

If someone posted something really nasty there, then probably I would ask them to take that away and next time consider at least a little before posting. Male, P 1, G 1

When rules of thumb are agreed upon explicitly, they take the form of a *collaborative, behavioral strategy*. Such a guideline can be helpful when one is trying to avoid violating others' objectives and expectations. Our material included one example of such *explicit negotiation*. The interviewee reported how the friend group had agreed on a common norm concerning photo sharing on Facebook:

During our freshman year, we had a rule that bikini pictures of girls are not posted, or any photos of anyone in our friend group who wasn't fully dressed, and that was good. Male, P 4, G 2

Another collaborative, behavioral preventive strategy is to *ask for others' approval* before disclosing content that concerns them. These checks are often made through other media, such as e-mail:

I'll ask in an e-mail message, "I'm going to post these five pictures on Facebook. Do you approve that, or is there a problem?" Male, P 7

These collaborative actions typically cannot be performed easily through an SNS itself. SNS-users need to invent alternative ways to clear whether the other people involved approve of the content they plan to publish. This added layer of difficulty is prone to push SNS-users toward relying on mental strategies instead of on explicit collaboration.

Controlling offline behavior

Efforts to manage what is being shared online are not limited to online environments. Some participants reported regulating their actions in offline settings, too. They did this in order to prevent compromising material from being shared online by ensuring that such material was not produced in the first place. Here, the revelation lies not so much in their attempts to avoid embarrassment by behaving in appropriate ways as in these efforts taking place offline for the sake of one's self-presentation online:

A couple weeks ago, I was at a fun party. But it was confusing to see people going like this [strikes a drunken pose] every time their pictures were taken. Since the photos will be on Facebook tomorrow, you were trying to look like, I don't know, not as drunk as you are. Female, P 8

Corrective strategies

Despite efforts to prevent blunders, actions in SNSs sometimes have unexpected and unintended outcomes. Corrective strategies of balancing privacy and publicness are typically asynchronous and reactive. They are applied when something in the boundary regulation breaks down. Participants resort to these strategies when they notice such a situation and, hence, feel the need to regain control.

Deleting content

Corrective strategies include *deleting comments or tags*; *asking another SNS-user to erase content that is under his or her control*; and, in the rare cases where collaboration fails, *reporting inappropriate content to service administrators and asking them to remove it*.

Behavioral strategies for regaining control over boundary regulation that are supported by Facebook's technical features are *individual*. That is, despite others' actions, SNS-users can regulate boundaries, for instance, by *deleting comments* in their own profiles as well as ones they have posted elsewhere themselves. Furthermore, Facebook allows *untagging* – that is, the deletion of identifying tags from photos. In line with previous findings [12], where the vast majority of students surveyed reported untagging themselves from Facebook photos, untagging was a common strategy also among our participants:

[W]hen people upload indiscreet photos, such as drunken-looking photos from a student party, I untag them and maybe even remove at some point. Male, P 4, G 2

As with preventive strategies, strategies that exceeded what SNSs support were needed for regaining control over boundary regulation. Incidental data [19], content added by others, cannot be deleted by the person concerned unless on a page he or she manages him- or herself. Efforts to regain control over problematic content, such as *asking another person to delete a photo*, require mutual attention, and willingness to take into account others' concerns over privacy and publicness. In some cases, participants felt that there was a shared understanding that would make it possible to use corrective strategies in an effective way:

We at least had an unspoken deal that if there is a bad picture it is enough that one person asks for it to be deleted and as soon as that request is noticed, the picture is removed. Female, P 13, G 2

Some participants had succeeded in getting a photo removed by *reporting* it in Facebook. This strategy relied on the service's administration and required several people to report the same photo. Reporting is, thus, a collaborative strategy but, paradoxically, it is one that is needed only when collaboration has failed in the first place. As the quote above illustrates, the participants expected that when asked, others would remove content that they deem problematic.

Interpreting content to be non-serious

Finally, *interpreting something to be non-serious* is a mental corrective strategy to diminish the perceived seriousness of interaction in a social network service. While it is typically an individual strategy, in some situations it can be supported by active, collaborative, behavioral strategies. For instance, when asked how they would react to an ex-partner commenting bitterly on a status update about a trip with a new partner, two participants (from Group 1) stated the following:

P 1: "*I guess my friends would post smileys after that or something [laughter] like that*"

P 12: "*That would be such a joke*"

Crucial here is the expectation that others support the target of the bitter comments by framing the situation as not serious, even amusing. Also, many participants stated that the person commenting in an inappropriate manner would be the one whose reputation would be at stake, not the person who is targeted by the comment. To maintain one's self-presentation before a mixed audience, one could remove the comment, but our participants did not deem this necessary, since they trusted that others will interpret corrective jokes in the right way and, therefore, will not view the interaction in a serious manner.

Shortcomings of corrective strategies

There are several reasons corrective strategies may be ineffective and socially problematic. First, the reactive nature of corrective strategies hinders their effectiveness. While publicized content can be hidden after publication, there is always a risk that someone has already seen it.

A further problem with corrective strategies is that the significance of disclosed content may in effect increase, not diminish, with deletion. If a piece of content has already been seen online, its removal can highlight that "*something was going on*" and so enhance the fuss around it. The removal of a piece of content, when noticed, can bring into question an important value, authenticity. While our interviewees appreciated discretion, "*too deliberate*" impression management was not valued.

Furthermore, deleting tags or comments can be interpreted as admitting a failure in boundary regulation. Participants

intentionally managed their self-presentation, but some felt awkward if "*caught*" while doing so. They brought this up when discussing the awkwardness of removing or reporting photos another person has posted:

[I]f an acquaintance, or a person important to me has posted them there, then at least I don't dare to use that button. I'd rather try some other means. Male, P 14

As seen throughout the analysis, trust and trustworthiness play important roles in regulation of privacy and publicness boundaries. This is part of why corrective strategies are problematic from a relational perspective: as interpersonal boundary regulation is based on trust in others, correcting others' actions or asking them to correct something undermines their efforts to live up to expectations. While it is almost inevitable that blunders sometimes happen, current corrective strategies are not ideal for coping with them.

DISCUSSION

Our study depicts boundary regulation in SNSs as a dynamic process wherein no one can be fully in control and in which the decision about what an individual looks like is always shared between him or her and others. However, people are not always attentive of the agency they have over others. Furthermore, predicting the effects of one's disclosure on another SNS-user's boundary regulation can be practically impossible. Blunders in boundary regulation seem to derive often from the difficulty of estimating how something would be interpreted in others' varied networks.

Proceeding from a review of prior work and an analysis of how SNS-users discuss the interdependence in boundary management in SNSs, we have formulated a framework of strategies for managing privacy and publicness that both systematizes and extends the explanations identified in previous studies of interpersonal disclosure management [2, 5, 12, 13, 14, 20, 23, 24]. The first two dimensions are derived from previous research: 1) *preventive* and *corrective strategies* and 2) *mental* and *behavioral strategies*. From our study, we add 3) *individual* and *collaborative strategies* as a third dimension.

The categories of our framework are to be considered dimensions that may overlap. The framework and the empirical findings from our qualitative study are illustrated in Table 1. We acknowledge that it is difficult to draw a strict line, for instance, between mental and behavioral strategies, since the two are closely related, yet we believe these divisions can be analytically helpful in identifying different approaches to boundary regulation and in exploring the variety of boundary regulation strategies. Our analysis indicates that the strategies are not necessarily reflexively pondered; instead, they are often tightly enough integrated with routines of everyday interaction to be employed in an almost automatic manner.

The centrality of concern about mutual consideration in management of privacy and publicness in SNSs shows the limits of individual strategies. However, overall, we found greater variety of individual than of collaborative strategies. Furthermore, our participants seemed to use individual strategies more commonly than collaborative ones. The majority of collaborative strategies found in our material were corrective, but preventive ways to collaborate with others were present, too. Our analysis shows that, even in the absence of collaborative tools, SNS-users apply a wide variety of strategies for managing privacy and publicness.

Some SNSs support individual preventive strategies, such as sharing content groupwise and sending private messages. Some corrective strategies, such as deleting certain types of content, untagging, and reporting inappropriate content to service administrators, are supported. However, when it comes to collaboration, current SNSs (Facebook being the most popular among our interviewees) offer scant and mainly corrective tools for regulating boundaries. The problem in understanding the situation this way is similar to mistaking a complex board game for Solitaire. Collaborative, preventive strategies are needed, since it is hard to know others' networks well enough to take them effectively into consideration.

Corrective strategies risk not being socially feasible or effective, even when technical tools for applying them are available. These strategies have at least three serious shortcomings that can make them ineffective or, worse, counterproductive. First, corrective strategies are often socially awkward. Second, they can be ineffective: once something is posted, it may be too late to hide it. Third, corrective strategies can even draw extra attention to the exact thing that was supposed to be swept under the carpet.

Our findings indicate that the lack of tools for managing disclosure collaboratively within SNSs drove people to come up with strategies applied beyond the service – for instance, via e-mail or face-to-face discussions. While this is prone to disrupt the use experience, a more severe outcome is that many continue to struggle with managing privacy and publicness individually when they could tackle the challenges more effectively in collaboration with other individuals.

Finally, as a call for caution in generalizing our results, it should be noted that the pool of participants was limited to a higher education institution in a particular cultural setting. Quantitative future work with a more varied population would be beneficial to complement this explorative, qualitative study.

CONCLUSIONS AND IMPLICATIONS FOR DESIGN

In this paper, we have shown that management of privacy and publicness in SNSs is largely based on expectations of others' attentiveness to one's self-presentation, both in how they behave and in the interpretations they make. Boundary regulation relies largely on unspoken expectations of reciprocal attentiveness. However, reliance on unspoken expectations makes SNS-users sensitive to unintended harm, since, despite the good will of not wishing to cause

Table 1: Examples of strategies for managing privacy and publicness in an SNS (mental strategies are presented in *italics*)

Strategy Type	Preventive	Corrective
Individual	• Creating separate audience zones (sharing content groupwise, sharing content according to proximity category, or using multiple accounts – in one or more services) • Adjusting privacy settings to disable disclosure (of certain types of content and/or to certain people) • Choosing a private communication channel (private messages) • Using deliberate wordings and tones in (semi-)public posts • Avoiding publicizing content that could be problematic • Withdrawing from publicizing altogether • Regulating one's behavior offline • *Considering trust and trustworthiness* • *Applying rules of thumb in decisions on sharing*	• Deleting comments (in one's profile and/or comments one has posted elsewhere) • Untagging photos • *Interpreting a potentially problematic issue to be non-serious*
Collaborative	• Negotiating and agreeing on "rules of thumb" concerning sharing with other SNS-users • Asking for approval before disclosing content from those involved	• Asking another person to delete content • Reporting inappropriate content to service administrators • Supporting a non-serious interpretation • *Interpreting content to be non-serious*

trouble for others, blunders happen and actions have unexpected outcomes.

On the theoretical side, this paper advances the discussion of boundary regulation in networked communication settings (for instance, see [17, 24] that draws from Altman's work [3, 4], by showing how technological design choices and social practices are intertwined and cannot be meaningfully studied in isolation in this field.

When one is exploring the challenges of boundary regulation, it is not sufficient to focus on how individuals manage what they disclose of themselves online – that is, disclosed and entrusted data. Privacy and publicness are at stake also when it comes to incidental data and, as importantly, when an individual discloses content related to others. While Schneier's taxonomy [19] is a welcome demonstration of the varieties of data, it does not explicitly consider the interpersonal nature of privacy and publicness.

We believe our framework can be a fruitful starting point for further work in the field. The framework is best understood as an analytical device that both systematizes analysis of strategies for boundary regulation and aids in opening an actionable privacy design space for SNSs.

We identify a design challenge in supporting collaborative, preventive strategies of managing online disclosure, such as encouraging SNS-users to discuss their expectations and negotiate privacy issues *before* conflicts emerge. Squicciriani et al. [20] have already experimented with an application designed for negotiating shared ownership through voting. We hope that our framework will spur designers on to approach boundary management as an interpersonal pursuit. As an example, we propose that SNSs could provide a preview space wherein boundaries could be negotiated collaboratively within a group of those whom the content concerns before it is published for a wider, mixed audience. For instance, an SNS-user sharing content could send requests for acceptance to others involved, before the piece of content is publicized. Such a technical solution would create some overhead in the form of requests to collaborate, but, at the same time, it would lighten the burden of pondering sharing decisions alone. We believe collaborative negotiation can facilitate the sharing of content whose audience is difficult to anticipate, such as photos.

It is a common claim that SNSs have few incentives to support effective privacy management, since this could lead to less content being shared. We believe features supporting collaborative boundary regulation could serve the interests of both end users and service providers. Allowing people to negotiate boundary regulation in an SNS would save them the detour to other communication media. This could increase the amount of shared content, because fewer individuals would feel the need to withdraw from disclosing data through fear of violating others' expectations.

We invite researchers and practitioners alike to look into the theoretical and design space outlined by our framework. SNS-users may continue to struggle with managing privacy and publicness individually, when they could tackle the challenges more effectively in collaboration with other individuals. After all, we are in it together.

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