

# Mailing Lists: Why Are They Still Here, What's Wrong With Them, and How Can We Fix Them?

Amy X. Zhang

MIT CSAIL  
Cambridge, MA 02139, USA  
axz@mit.edu

Mark S. Ackerman

University of Michigan  
Ann Arbor, MI 48109, USA  
ackerm@umich.edu

David R. Karger

MIT CSAIL  
Cambridge, MA 02139, USA  
karger@mit.edu

## ABSTRACT

Mailing lists have existed since the early days of email and are still widely used today, even as more sophisticated online forums and social media websites proliferate. The simplicity of mailing lists can be seen as a reason for their endurance, a source of dissatisfaction, and an opportunity for improvement. Using a mixed-method approach, we studied two community mailing lists in depth with interviews and surveys, and surveyed a broader spectrum of 28 lists. We report how members of the different communities use their lists and their goals and desires for them. We explore why members prefer mailing lists to other group communication tools. But we also identify several tensions around mailing list usage that appear to contribute to dissatisfaction with them. We conclude with design implications, discussing ways to alleviate these tensions while preserving mailing lists' appeal.

## Author Keywords

mailing lists; email; online communities; discussion groups

## ACM Classification Keywords

H.5.3. Group and Organization Interfaces: Asynchronous interaction; Web-based interaction

## INTRODUCTION

Just four years after the invention of email, the first mailing list, MsgGroup, was created in 1971 to help Arpanet users discuss the idea of using Arpanet for discussion. In the 40 years since, mailing lists have become pervasive, helping communities share information, ask and answer questions, discuss issues, and build ties. More recently, alternative methods of group communication have emerged, including discussion forums, Q&A sites, and social networking sites. As other tools gained prominence, some believed that mailing lists would die out and be replaced [14]. But mailing lists continue to be widely used.

Despite ongoing use, mailing lists have changed little from their original design. There have been some modifications and advancements, but generally mailing lists are used much as in the 1970s. While mailing list development stagnated,

newer applications and websites have introduced numerous collaborative curation features, including following, tagging, and social moderation. These new systems and their features have been studied extensively in recent years. Email clients have also undergone dramatic changes in the last 40 years, so that now many people access their email in new ways [7]. Though email access practices have shifted due to features like automatic filing, the mailing list model has not.

Given the continued pervasive use of mailing lists, the lack of new development or research surrounding them, and advances in our social computing systems, we believe that a closer study of mailing lists today could reveal significant room for improvement. We consider the following questions:

- What are the reasons people continue to use mailing lists in the face of modern social media tools?
- What are the problems and limitations of mailing lists that remain despite their continued use?
- How might we address these problems and limitations without ruining what makes mailing lists so attractive?

To gain insight into these questions, we studied the use of mailing lists by two communities through in-depth interviews. We augmented this qualitative examination with a survey of more members of these two lists as well as 28 additional mailing lists of varying community types. We explored the diversity of goals, expectations, and perceptions among community members subscribed to lists, and how this can leave many users dissatisfied. In more detail,

- We observed significant disagreement over the preferred types, quantity, and tone of email delivered over each list;
- We found that many users muzzled themselves and others posted too much, based on their perception of others' preferences—perceptions that were often wrong;
- In particular, we found that the wide variation in how users handle incoming email influenced their perception of how the list should be used, to the detriment of others; and
- We saw that despite these problems, many users considered the mailing list superior for group communication to both web forums and social media for a variety of reasons.

Given these findings, we explore a design space for allowing diverse users to *all simultaneously* use the same mailing list in their different preferred ways without negatively impacting users with different preferences. Our results suggest that mailing list users could benefit from *greater flexibility and control* in how they choose their audience and their incoming content, and this might encourage more contributions that the community finds valuable. We also find a need for *greater*

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*transparency and social awareness* within mailing list systems to allow users to better know who their audience is and how their content is received.

## **BACKGROUND AND RELATED WORK**

In the 1990s to early 2000s, there was a great deal of excitement over the potential of mailing lists to connect geographically dispersed people in scholarly and professional circles [10]. Studies found that lists allowed highly affective interpersonal interactions [17], encouraged reflection [10], and extended users' social capital [16]. However, even then there were problems, such as complaints about flaming, lurkers, off-topic threads, and information overload [26]. There was also frustration with the need for time-consuming administrative moderation to maintain quality discourse [4]. Some issues with mailing lists in that period simply reflected general problems of email overload [5, 28]. Given the inflexible design of mailing lists, users had no recourse except to unsubscribe when they felt overloaded [26]. Problems were magnified when the messages were deemed nonessential or served a different purpose than regular email, as was often the case for mailing lists [22]. This suggests mailing lists may have exacerbated email overload.

Much has changed since these studies, suggesting we should re-examine mailing lists in light of today's email clients and practices. Popular clients such as Gmail now have features such as threaded conversations and automatic filing and tagging, which may help with interruption fatigue and overload. However, this automatic handling may change the way users access their mailing list email to something more like news feeds [23] such as on Facebook or Twitter, where users can dip in occasionally to view content [2]. While much research has explored how email practices may affect the recipients of email [8], we also consider the perceptions and attitudes of *senders* of email, including how their expectations of how others receive their email can cause tensions.

Research on motivations within group discussion systems since the early 2000s have primarily focused on newer social media. Studies have looked at what content users share and why [6, 11], and what they self-censor and why [24, 27, 15]. Research has also looked into the motivations for participation specifically in online groups [21]. Research on Facebook Groups suggests that it is used for information sharing [25] as well as for socialization [20]. We extend this work by considering the ecology of options for group discussion today, specifically comparing users' perceptions of mailing lists with those of more modern systems. Additionally, we bring attention back to the study of mailing list communities so as to encourage innovation in this area. We address a gap in the research literature by considering how mailing lists could be improved given their simple design, and we reflect on how we might incorporate some of the features in modern social media without losing what makes mailing lists valuable.

## **DATA COLLECTION**

We collected both interview and survey data. We used qualitative interview data to gain a deeper understanding of the two communities we studied. The surveys, which reached a

larger user population and a more diverse set of mailing lists, let us triangulate our interview findings.

## **Interview Study**

We began in May 2014 with in-person interviews of members of two mailing list communities, summarized in Table 1 and characterized in more detail in the next section. The mailing lists were chosen because they were well established in terms of age and integration into their respective communities, giving them a sizable membership, community participation ratio, and posting frequency that would allow for interesting dynamics to be observed. Our first mailing list, called DORM, is for members of a 300-person undergraduate dormitory of a mid-sized U.S. university. We interviewed 10 (4 female, 6 male, median age of 22) members, including 8 undergraduates and 2 residential advisors. Our second mailing list, called LAB, is for members, affiliates, and followers of a 1000-person technology research lab in a different mid-sized U.S. university. We interviewed 10 (1 female, 8 male, 1 other, median age of 30) members, including 1 professor, 2 administrators, 2 researchers, 4 graduate students, and 1 former graduate student. Potential interviewees were recruited by emailing the target list, by emailing related mailing lists, and by word-of-mouth. We selected interviewees to reach a diverse set of users in terms of affiliation to the community, length of time in the community, and level of usage, including those who used the list infrequently or were unsubscribed.

Interviews were conducted by the first author, lasted from 20 to 80 minutes, and were mostly open-ended to allow users to describe their experiences in detail. Before the interview, we asked interviewees to reflect on their experiences and bring two posts or threads that were memorable in either a good or bad way in order to ground our discussion. We began the interviews by asking users about the posts they brought as well as their inclination or resistance to contributing in those instances. We then asked general open-ended questions about the mailing list, such as their opinions and participation level. We also had interviewees bring their laptops and demonstrate their strategies for organizing their mailing list email within their email client. Finally, we asked users to compare their mailing list with other community discussion systems that they used and to imagine what the list would be like if migrated to such alternative systems.

We employed a grounded theory approach [3] to elicit themes from the interviews. The interviews were coded by the first author using standard qualitative coding techniques [18] to find concepts around what users liked about mailing lists, frustrating or rewarding experiences, and moments of doubt or self-censorship. The authors as a group iteratively discussed the codes and grouped them into themes. Some groupings were generated from concepts that seemed contradictory; these form the tensions that we will describe later. Others were generated from commonly-expressed explanations for behaviors and preferences.

## **Survey**

Using the themes generated, we then built a survey to see whether our interview findings could be confirmed by a larger

	Interview	Survey	Subscribed*	Posters**	Membership	Archives	Posts/day***	Moderated
DORM	10	43	541	531	restricted	public	15.75(13.53)	No
LAB	10	108	4,147	708	unrestricted	public	6.45(5.25)	No

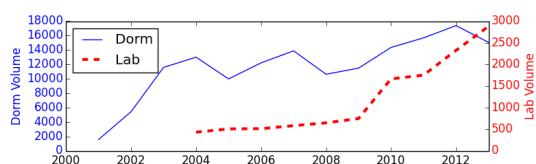
**Table 1. The two mailing list populations studied in depth. \*Number of subscribers in May 2014. \*\*Posters refers to the number of unique contributors from June 2013 to June 2014. \*\*\*Average number of posts per day, followed by standard deviation, from June 2013 to June 2014.**

subset of the two communities and by a more diverse set of mailing list communities. Our 4 page SurveyMonkey web survey combined multiple choice questions, free-response questions, and 5-point Likert scales. In addition to DORM and LAB, we surveyed 28 other mailing list communities. These communities were found by asking others to publicize the survey to mailing lists they used. We aimed to reach a diverse set of mailing list populations and selected communities of varying sizes and functions.

Our survey investigated users' attitudes towards and perceptions of their mailing list, which is why we relied on self-reported data. To build the survey, we took the themes from our interpretive analysis and constructed sets of questions, with some multiple choice responses taken from the codes extracted from the interviews. We asked users about their strategies for managing their mailing list email and characteristics of the list. We inquired whether they cared about things like missed email, irrelevant content, or high volume. We delved into how users felt about lengthy discussions and what gave them pause when considering posting. Finally, we asked users to rate potential changes to the list, including introducing hypothetical features and moving to alternative systems.

We screened out 74 people who completed the survey in under 4 minutes, completed less than half, or had a variance below 0.5 for answers to Likert scale questions, which had items of reverse valence. Of 415 remaining participants, 43 (37% male, 56% female, median age 21) were from DORM, 108 (67% male, 23% female, median age 27) were from LAB, and 264 (33% male, 65% female, median age 21) were from other lists. Some chose not to divulge their gender or age. The demographics for DORM and LAB respondents reasonably approximate those of the membership. We did note a slight skew in gender towards more female respondents; however, we were careful to consider this in our analysis and did not find reason to suspect it would alter our main findings. The total number of subscribers and unique contributors in the last year for DORM and LAB are shown in Table 1. We presume that some email accounts were inactive or were filtered into a spam folder, but expect the number of people actually reading the mailing list to be somewhere between the subscriber and unique contributor count. Thus, we believe the real response rate to be above 5% for both communities.

Our recruitment method of emailing the mailing list did not reach people who had left the list previously or did not check their email in time. This presents a non-response bias in our survey data, though we did take care to find and interview people who had left the list or did not check it frequently. We were able to reach these people by inquiring in person to members of both communities. We discuss potential biases in more detail below. Though we report numbers in the following sections to describe our survey results, these numbers



**Figure 1. Total number of emails per year for DORM and LAB.**

should be regarded as indicative due to our low response rate and potential biases. For the Likert scale questions, we report 1-2 as disagreeing with the statement, 3 as neutral, and 4-5 as agreeing.

## THE MAILING LIST COMMUNITIES

We begin with a deeper look at the communities that we interviewed and surveyed.

### The DORM Mailing List

As shown in Figure 1, the DORM mailing list was started in the fall of 2001 and increased in volume in the years since. The community of DORM is composed of primarily undergraduates and some residential advisors and staff that live together in dormitory housing. Students are randomly assigned to the housing community during their first years and stay until they graduate, so they generally know each other by name or face. Students are automatically added to the mailing list upon joining the community and removed when they leave, though they can unsubscribe at any time. As Table 1 shows, the number of unique posters over the year from June 2013 is quite close to the year's subscription number, meaning almost all users posted to the list. However, about 25% of the unique posters only posted once. Interviewees described the content as comprised mostly of publicity for events organized by students for other students, with event announcements appearing several times a day. This activity is so prevalent that students name it "pubbing." This may explain why only about 30% of the year's posts were replies. During our study, there were also many posts by graduating seniors selling items, highlighting the periodic nature of content driven by the school year cycle.

### The LAB Mailing List

The LAB mailing list was started in 2004 and has since seen a considerable increase in volume, also shown in Figure 1. The LAB community is composed mostly of current and alumni graduate students and some faculty, research staff, administrators, and undergraduates that are members of a technology research institute. Graduate students are automatically added but can unsubscribe at any time. The list is public, so affiliates of the lab or interested parties may also be on the list. The volume is generally less than DORM and varies less. Interviewees described the list as a general-purpose list for the lab,

with many job postings, housing listings, event announcements, and occasionally interesting discussions. As seen in Table 1, there are over 4,000 subscribers although only 708 unique people posted in a year's time, suggesting that there are many lurkers and dormant accounts on the list. Of the people who did post, 51% only posted once. At the other end, the most frequent poster on the list posted over three times as much as the next most frequent poster. This person was referenced many times by name in both interviews and surveys as a polarizing and outspoken list member.

We additionally surveyed 28 other communities, with 3 sports teams, 8 extracurricular or cultural clubs, 5 academic groups, 6 dorms, 1 sorority, 3 social clubs, and 2 neighborhoods. Though we reached communities of different sizes and functions, many of them were connected to a university or were comprised mostly of university students due to our method of convenience sampling. In a further section, we address the generalizability of our findings in light of our sample.

### WHY ARE MAILING LISTS STILL IMPORTANT?

We first turn towards understanding why people still use mailing lists today in the face of modern communication systems. Following this section, we will address problems related to mailing lists before discussing potential fixes to these problems, keeping in mind the positives we explore here.

We asked users to rate how often they used different group communication systems, including mailing lists, Facebook Groups, Google+ Communities, subreddits, or discussion forums. We found that after mailing lists, the next most popular tool for group communication was Facebook Groups. When asked about the Facebook Groups they were on, interviewees overall said that there was generally little activity and that they checked them much less frequently than their mailing list emails, even if they checked Facebook several times a day. Some interviewees mentioned that DORM and LAB in fact had Facebook Groups, but that they had low membership and were mostly dormant. When we refer back to Figure 1, we can see that volume on both mailing lists has gone up substantially over time even during the growth of Facebook.

We asked users to imagine moving their mailing list to other systems and consider what would change. Overall, interviewees believed that moving their list to Facebook would result in less activity or discussion and preferred to continue using their mailing list. From the surveys, only a small minority of respondents liked the idea of moving their mailing list to a Facebook Group (13% agree, 15% neutral, 72% disagree). We found even lower percentages in favor of moving to a subreddit or a web forum (5% and 9% agree respectively). We now explore several differences we encountered in how people thought of email versus social media and how this played into their preference for mailing list communication.

#### *Email is for Work, Social Media for Play*

From the surveys, a majority of users thought that email was more professional than Facebook (61% agree, 25% neutral, 14% disagree). In a similar vein, interviewees associated discussion forums like Reddit with procrastination. When asked if the mailing list should move to Facebook, one user said:

*I wouldn't be surprised if people start posting cat videos to this. [Facebook] has been a distraction for most people...When I look at [LAB]...I don't see it as a place to post cat videos. -LAB*

While interviewees overall felt that their mailing list content was more work-related than content on social media, many interviewees also agreed that some posts on the mailing list were not work-related. One interviewee who enjoyed reading discussions on the mailing list felt that these discussions would not thrive on Facebook, but they also did not quite fit with his perception of email as more work-related:

*...it leaves the open discourse in an awkward split between personal conversation, Facebook Groups, and the part of email that's not all business-y. -DORM*

The overloading of email with different types of content has been described in prior work [8]. Overall few survey respondents minded that group discussions were going into their email (14% agree, 22% neutral, 64% disagree), though our data is biased in that users who unsubscribed were less likely to respond to our survey. Some interviewees, one of whom had unsubscribed, indicated that the discussions in their inbox distracted them from their work-related emails.

#### *Email Feels More Private than Social Media*

When explaining low activity on Facebook Groups, a number of interviewees said that social media somehow felt more public than mailing lists. This was interesting because it was technically untrue; both mailing list archives were public while a private Facebook Group would not be publicly visible. However, most interviewees of both groups were surprised to hear that the mailing list archives were public. We also found that both interviewees and those surveyed severely underestimated the number of people on their lists, echoing other research [1]. For instance, only 7% surveyed from LAB accurately estimated how many people were subscribed. Instead, the median guessed list size was 500-800 people, an order of magnitude less than the actual subscription count.

Some interviewees reasoned that the archives were harder to access and read, while it would be easier to scroll down a group's Facebook page. Also addressing public exposure, many interviewees commented that on Facebook people's identities were more tied to their messages because of the proximity of profile images and linked profiles:

*There's a greater sense of [Facebook] being public...you can see everybody who's on there. It's very visible, very present. Whereas on email, you're sending it into the mystic...you don't see all the faces staring back at you. -DORM*

#### *Greater Confidence that Email will be Seen*

Many interviewees expressed the opinion that their mailing list emails were more likely to be seen than a social media post. This may be partly due to email's "push" model (see below) where emails are *delivered* to all recipients. In contrast, systems like Facebook that employ an opaque algorithm for displaying content make a mystery of who receives what:

*Facebook plays games with what they show people and so there's no even clear notion of who it is that's seen what you're sending...[Email's] really the only mechanism where it comes with this feeling of it'll get seen. -LAB*

Despite the popularity of Facebook, many interviewees also mentioned knowing people in the community who were not on Facebook but used email; reaching these people clearly requires using email. Several interviewees also stated that they checked their email more often than they checked Facebook, with a majority of those surveyed agreeing (67% agree, 14% neutral, 19% disagree). Users might therefore sense that email delivery will be more timely than social media delivery. Like the privacy perception, this perception that mail will be seen and seen quickly can also prove false due to other recipients' filtering choices, as we shall explore later.

### Email Management is More Customizable

Another difference between email and social media is that email, using the SMTP standard, is more readily customizable and viewable with many different interfaces. Many interviewees preferred to have the flexibility to set up custom filters, tags, or notifications. One interviewee expressed frustration with Facebook's interface, which is not customizable:

*You only have the choice [on Facebook Groups]...I want to watch every message...or I don't. If you say yes, then...your cellphone [is] beeping every 5 minutes. If you say no, you're going to miss everything. There's no in between where once a day I can...see what's new. -LAB*

In the survey, a majority said that they enjoyed having the flexibility and power to organize their email the way they wanted (67% agree, 22% neutral, 11% disagree).

### TENSIONS WITHIN MAILING LIST COMMUNITIES

We now turn to examining several tensions that we observed within the mailing list communities we studied that may lead to problems. To facilitate our exploration, we categorize the types of mailing list posts into *transactional* (events, sales, etc.) and *interactional* (discussion, humor, etc.) communication. These categories have been used for spoken discourse and found in prior mailing list studies [9]. We acknowledge that not all posts fit easily into one category and that some intended transactional posts become interactional.<sup>1</sup>

Breaking down the mailing list content more finely, we asked survey respondents to self-report how often certain types of posts occur and also how often they would *like* certain types of posts to occur. In Figure 2, we plot the difference for DORM and LAB. To validate our survey results, two people were employed to manually tag 100 random emails from May 2014 from each mailing list into one of 9 categories we chose, given the subject line and body of the email (Cohen's kappa = 0.698). After resolving disagreements through discussion, we found that with minor exceptions people's perceptions of how many emails they received of each category generally aligned with the normalized frequencies we found. For instance, our tagging over-reported the category of "interesting discussions" compared to survey respondents' perceptions. This may be because we could only safely tag all emails that were discussion-related, without knowing the context for whether it was interesting or annoying.

<sup>1</sup>For instance, our post to LAB soliciting participants for our survey turned into a multi-week, 70-post discussion on the ethics of using Amazon gift cards as a reward.

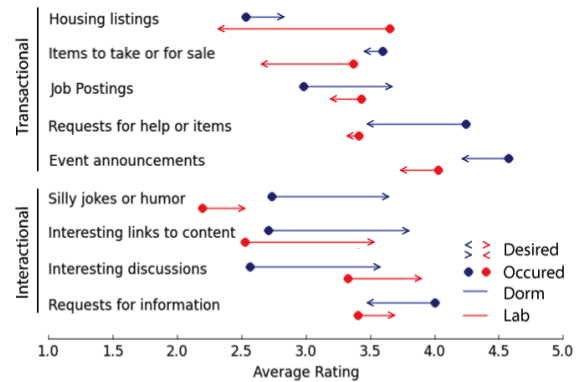


Figure 2. Survey results drawing an arrow starting from the number of times users stated a type of post occurred (circle) and ending at how often users would have liked for it to appear (arrow). Ratings are displayed as averages. Scale is 1–Never, 2–Once a month, 3–Once a week, 4–Once a day, 5–More than once a day.

DORM	
+	One of my favorite...types, is the sort of intellectual discourse...there was a golden time, where you had the right combination of people, you could get a good...intellectual discussion.
-	I personally am glad that [the discussion is] gone. I think it keeps [DORM] to be much more efficient.
LAB	
+	I sometimes wish there were more meaningful conversations about technology and less about logistics and so on. ...Those things show up a lot in talks but I don't think people discuss them enough.
-	...if I had to pinpoint an ideal level for me, personally, I don't know, maybe 10 to 15 percent less of what [the discussion level] currently is right now, would be great.

Table 2. Interview quotes expressing positive and negative feelings about interactional content on the two mailing lists.

### Tension 1: Type and Quantity of Content

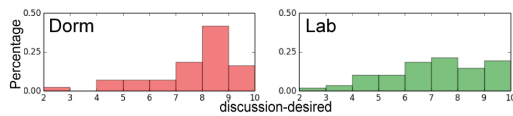
Our interviews revealed that often users, even within the same community, had different ideas about what their mailing lists should contain. For instance, we learned from the senior student interviewees of DORM that the mailing list used to have more discussions during their sophomore year, because of a certain set of outspoken seniors. Table 2 shows that interviewees disagreed on whether that was a good thing. Interviewees in LAB also disagreed on the optimum level of interactional content. When it came to more specific categories of email, such as the ones in Figure 2, interviewees also disagreed. Some interviewees were strongly in favor of more lighthearted humor or silliness on the mailing list while others were strictly against it. As another example, one interviewee spoke about job postings:

*I think people will differ in that evaluation. I'm sure there's lots of people who actually appreciate the job postings and stuff whereas I'm not looking for a job. -LAB*

Some users acknowledged the tension between the two functions of the list:

*The users of [DORM] are the types of people that don't really care about spammy stuff in their inbox ...Only upon reflection of what [DORM] used to be, do I stop and think like yeah, maybe that spammy stuff kind of pushed out more of that intellectual conversation... -DORM*





**Figure 3.** The *discussion-desired* measure, from 2–least desired to 10–most desired, for DORM and LAB.

When asked if the mailing list should stick to informational posts, a sizable minority of survey respondents agreed (24%). On the flip side, 34% wished the list had more discussions. Because these two questions were inter-related (Cronbach’s alpha = 0.704), we added them together to create an overall *discussion-desired* measure. The average variance within the communities was 1.95, demonstrating a large spread of preferences. Figure 3 shows that while there was a general trend in both lists towards wanting more discussion, there appeared to be no one level of discussion ideal for even a large plurality of users.

Users also had very different ideas about how on-topic their list content should be. Some interviewees were sensitive to relevance and stated that they would leave the list if there were an increase in the number of irrelevant emails:

*...I don’t like getting email. Especially when it’s not applicable.* –LAB

Other interviewees didn’t mind irrelevant content because they wanted to feel more connected to the community and liked knowing what was going on, even if it didn’t affect them. Some also appreciated serendipitous discoveries:

*There’s always that case that there’s an event or something that I’m like, “...This is really cool.” I never would have found that, if it wasn’t for [DORM]. ...To reduce those [types of posts] would be probably detrimental to those small instances.* –DORM

Interviewees additionally disagreed about whether replies to posts should appear on the list. The following two quotes are from different interviewees from LAB:

*...You might as well just post it [to the list]. If they’re not interested they can either skip over it, or quickly skim over it, or whatever.* –LAB

*I despise it when people hit the reply to all button instead of the reply to button.* –LAB

This tension over appropriate content could cause backlash or the fear of backlash against certain posts or behaviors, leading to self-censorship, as we explore further in Tension 2. It also shows that attempts to improve mailing list designs cannot be one-size-fits-all, but should instead strive to give users more control of what they get.

### Tension 2: Desire for Interaction vs. Hesitation to Post

As can be seen from the arrows in Figure 2, the desired occurrence is higher than perceived occurrence for most of the interactional content, while the opposite is true for transactional content. Despite this general desire for more interaction, we found paradoxically that *many users who wanted more discussions did not contribute to them*. One interviewee acknowledged the discrepancy between her actions and desires, saying:

*I think it is kind of a Catch 22...I want more discussion but I also don’t want to put myself out there...* –DORM

We found additional evidence of this in the surveys when we focused only on the respondents who said they wanted more discussion. Of the people who wanted more discussion, a majority of them had actually *never* participated in a discussion on the list (66%).

Though low levels of posting can be attributed to issues such as social loafing [12], we asked interviewees whether there were times when they wanted to participate in a conversation or had even written a post but did not send it. In these cases, users were *actively interested* in participating but were *deterred* for various reasons. We categorized the reasons that interviewees cited for why they self-censored their posts. Our survey then asked which of these categories gave respondents pause when posting. Though previous research has uncovered some similar deterrents [24, 27], a few stood out here. We report them for context and as motivation for some of our later design implications:

**Spamming Large Audiences:** Many interviewees stated that they were worried about spamming a large number of people. This was the most troubling of all the issues for LAB (62%) and the other communities that we surveyed (61%), but less so for DORM (43%) possibly because of the many event announcements on that list. One interviewee talked about the times he wrote long replies but never sent them, saying:

*I’m not sure what it is that I would be losing if I hit that send button but...I felt...I’m just spamming people...and I’m only perpetuating inbox overload to people.* –LAB

**Misinterpretation:** This issue was the most troubling of the issues for DORM survey respondents (67%). Many interviewees from DORM said that they were hesitant to engage in discussions of controversial issues over email for fear of mis-speaking and offending someone. This issue may have been more salient for DORM because members live in close proximity and all generally know each other. To them it felt difficult to craft a response that would be politically correct and not be misinterpreted:

*Writing an email that is nuanced enough for [DORM] without pissing people off just like takes so long that it’s not worth my time.* –DORM

**Heated Arguments:** People often expected that joining a discussion might lead to a heated argument they didn’t want to get into. Interviewees from DORM and LAB could both name particular people on the list that they felt were “trolls”—people who could be counted on to spark controversy, leading to repetitive arguments. This was the second and third most problematic issue for LAB (50%) and DORM (57%) respectively.

*...A couple times...I would feel like I had something to say and I would write this reply...I would spend a lot of time on it and then think this isn’t worth it...it’s just going to devolve into an age old argument of the same type that has happened over and over again.* –LAB

**Appearing stupid:** People from both communities were worried that they would be judged for appearing stupid. In LAB,

this often translated to being afraid to talk about technical issues, for instance:

*One thing that [LAB] is relatively devoid of is technical questions. You're keenly aware that the way...you'll ask a question signals an ignorance that you're afraid to show in [Lab] with such smart people. –LAB*

This was also the second most problematic issue for DORM (54%). One international interviewee said that she was embarrassed about her poor English and chose not to post questions, even when she really wanted help.

**Summary:** As can be seen, users were deterred from posting due to their fears of how their participation would be perceived by other members. We saw many users were afraid of spamming others with unwanted discussion, yet still a majority of people wanted to see more discussion. This highlights how these fears may sometimes be unfounded. Indeed many interviewees spoke of experiences where their participation resulted in positive outcomes. However, there were also times when users' fears were not unfounded, with arguments or harsh responses resulting. These conflicts may be exacerbated in part to differences outlined in Tension 1.

### Tension 3: Push vs. Pull Access

The last tension is related to how users chose to access their email and how this may have affected their attitudes and actions on the mailing list.

Information access and exchange has often been differentiated as *push* versus *pull*. In push systems, senders actively “push” content to recipients, while in pull systems, senders make content available and recipients “pull” it at their leisure. There are two aspects of push systems that are often expected: recipients receive all messages, and they receive them in real-time. Neither of these expectations hold in pull systems, where recipients can ignore content or read it when they wish.

Traditionally, email is considered a push system while discussion forums and message feeds such as on Facebook, Twitter, or RSS are accessed more like pull systems. But while email systems are push-based, some users' email access practices have become more pull-based. For example, some now use automatic filing to divert mailing list email away from their inboxes to separate folders. The difference in behavior of these users versus users in the same community who access their mailing list in a traditional way may lead to tensions.<sup>2</sup>

#### *A Pull Experience via Automatic Filing*

A currently popular practice is filtering email into secondary folders that are then accessed less often. Many interviewees said that they had their mailing list email automatically filed into a separate folder. One interviewee, explaining the difference between his interaction with his main inbox and his mailing list folder said:

*It does change your interaction. It's a lot less urgent. I perceive [DORM] as something that's less important. ...I want to check [DORM] so I'm going to open it and look at*

<sup>2</sup>A small part of our survey population (2%) also used digests to aggregate their list email, but we do not further focus on this group.

*it. ...Whereas with my email inbox it's coming there. I need to check this. –DORM*

Another user had mailing list email come to his main inbox until Gmail began automatically filing it into a Forums tab:

*Once Gmail made that change...most of my day is spent in the Important Email tab and I rarely look at the Forums tab. ...I think I skim [LAB] less not because of a disengagement from the list but just because the email client has suddenly hidden them... –LAB*

For some interviewees, filing the mailing list into a separate folder meant that occasionally they would forget to check it for an extended period. Others said that they purposefully checked the folder less often when they were busy.

*It doesn't feel like I can't keep up perhaps because I don't want to be reading every single email. –DORM*

*I treat it the same way that I would treat a...water cooler where you walk by and there's some colleagues talking...but you can't spend all day at the water cooler. –LAB*

In our survey, automatic filing was the most popular strategy for DORM and second most popular for all other communities (48% DORM, 17% LAB, 11% others). This difference may be due to the relatively high volume of emails that DORM receives. A majority of automatic filers reported that they did not mind missing email from the list (67% agree, 20% neutral, 13% disagree). A majority also reported that they read email from the list when they felt like it instead of when it arrived (70% agree, 15% neutral, 15% disagree). Additionally, many interviewees with this strategy stated that they did not mind irrelevant email or high volume from the mailing list specifically because the emails were being filed away.

#### *A Push Experience without Automatic Filing*

We observed a different attitude from the users who did not file their mailing list email separately from their normal email. These users had to go through each mailing list email just like any other email because it arrived in the same place. One such user noted problems that arose when he neglected to read his mailing list email:

*...[there's] the risk of missing important mails when I allow many to go unread because the state of being read or unread is less signaling... –LAB*

In our survey, receiving content in the main inbox was the most or second-most popular way of dealing with mailing list email (23% DORM, 58% LAB, 68% others). In comparison to automatic filers, a smaller proportion of these users did not mind missing email from the list, with more than double the previous population disagreeing (50% agree, 31% neutral, 29% disagree). Far more users also disagreed with the idea that they read email when they felt like it instead of when it arrived (36% agree, 16% neutral, 48% disagree). Interviewees also expressed an inclination to unsubscribe if email became more irrelevant or volume started to increase, making it more difficult to maintain a casual relationship to the community or benefit from serendipity:

*[Email] is something that I make an effort to stay on top of. I will unsubscribe from mailing lists if I think it's sending me too much email that's not relevant. –LAB*

### Comparison

The survey data supported our association of automatic filing with pull-based and of manual handling with push-based behavior, though the numbers we report here should only be regarded as indicative. We found that automatic filers were more likely to completely miss email from the list (18% vs. 7%) and to not mind missing email from the list (67% vs. 50%). Automatic filers also were more likely to only read mailing list email when they felt like it, not when the email messages arrived (70% vs. 36%). On the other hand, users who had no filing strategy were more likely to read every message from the list (81% vs. 75%).

In the interviews with automatic filers, we found an expectation that others were accessing their email in the same way and would not mind additional email:

*When...you get emails from someone, it doesn't take you that much time to just get rid of it. I think the people who really don't like spam already filter their [DORM list]... In which case my additional email really takes like three seconds of your time. —DORM*

An interviewee who did not have any strategy to differentiate his mailing list email had a very different thought-process when thinking of whether to post to the list:

*When I'm thinking about sending an email to [LAB], I'm like, "Wow, does every single person related to [LAB] really need to get this email?" If that's not the case, I probably wouldn't send it. —LAB*

Our interviews suggest that how people access their list email may impact how they feel about the list as a whole and how they then act as senders on the list. For instance, people who automatically file may assume that emails are not time-consuming and in turn may send more emails, annoying or overwhelming fellow members, or send less relevant emails, contributing to Tension 1. Conversely, people who read email from their main inbox may be more wary about spamming and thus not contribute as much, in relation to Tension 2.

## DISCUSSION

### Design Implications

Our results suggest that a better group communication system would preserve the characteristics that people appreciate about mailing lists but also provide new features to alleviate the tensions we found. We note that many of our findings are not fundamentally tied to mailing lists but point to general preferences and tensions related to information exchange and communication within communities. Thus they also suggest design implications for many group communication systems including social media.

Indeed, the challenges we have identified in this work can be addressed from either end—by modifying a social media system to address the problems that lead some users to prefer mailing lists, or by modifying a mailing list system to address the problems perceived there. Enterprise social media systems such as Yammer are taking the former approach, and it is clearly important to extend our study to understand how the issues we have raised play out in those systems. For example, a *separate* social media system for work may be able

to address the “Work vs. Play” concern we described for social media (but perhaps not the others).

But we believe that the second approach of “fixing mailing lists” has equal potential and may be far easier to undertake. For we benefit from the fact that the “user interface” for these systems is users’ own email clients. This means that these (server-only) mailing list systems are much smaller and simpler than social media systems, so are easier for researchers to modify. And many robust open source implementations exist as starting points for experimentation. Furthermore, changes to these systems by definition will not change the user interface, reducing the disruptions that can discomfit users, and allowing them to preserve all the customizations they have adopted. But perhaps most importantly, mailing lists are not a monolith like social media systems. It is possible to build a new mailing list system and shift a single mailing list to it that its members can continue to read (in their traditional clients) with no disruption. Getting users to move (with the rest of their community) to a new social media system would be far more challenging.

For these reasons, we have developed a new mailing list system, Murmur, (<http://murmur.csail.mit.edu/>) that we are beginning to deploy and test.

### Applying Social Media Ideas

To many of our users, mailing lists felt more professional than social media but still contained some content that did not quite feel work-related. This inspires us to consider how mailing lists could be designed to be something *in between social media and email* by continuing to stay within email technically while incorporating features from social media systems.

One issue we discussed is users’ concerns about excessive volume—both as recipients who do not want it, and as senders who fear imposing it on others. We also found in Tension 1 that users in the same community often have different ideas about what their mailing list should contain. These issues may be exacerbated by the differences in email access strategies shown in Tension 3. One potential way to fix discrepancies in content type could be to split the list into two or more lists, but this was rejected by a sizable minority surveyed (38%), due to fears of it leading to less participation and splintering of the community (this experiment was actually attempted in the LAB list several years ago, and none of the sub-lists gained traction).

A different way to address volume concerns and permit various preferences to coexist is to incorporate now-standard techniques from social media systems such as tagging (already explored in email in the Mail2Tag system [19]), social moderation, and collaborative filtering [13]. We’ve integrated these capabilities into Murmur, for example by using a blank reply as an up-vote and permitting tags in subject lines and replies. With this data, scoring and collaborative filtering can be used to decide which mailing list emails to forward to which individuals. We also provide a web interface to let users configure richer filtering of the list without giving up their preferred email clients.



### *Guaranteeing Delivery*

However, introducing these social media techniques can damage one of the key appeals of mailing lists: users' "guaranteed delivery" sense that they know who will (and who will not) receive their posts. While no longer strictly true (as we saw in Tension 3), this notion was an appealing aspect of email to many of our interviewees.

Working within email gives us a useful way to address these concerns. Email's organizational capabilities are richer than many social media systems'. Instead of just choosing whether or not to show a post as social media streams do, we could use information from message content, tags, senders, and social moderation to route *all* messages to different *folders* specified by the user, who could access different folders at different times and frequencies. Instead of social media's "look now or it is gone forever," readers could fit reading to their own schedules. Importantly, no user would *have* to configure anything—the default behavior of delivering all list email would persist.

We must also be careful to respect users' desire for control over what they receive. Algorithms for curating feeds may introduce biases and may be difficult for users to comprehend. Thus, schemes with *explicit, transparent* filtering rules may be appealing for users who reject the opaque selection mechanisms provided by many of today's social media tools.

### *Limiting Delivery*

On the flip side, we saw that many users were deterred from posting content welcomed by most users on the mailing list (Tension 2). Some of these deterrents were real (fear of trolls) and others were often imagined (concern that others wanted less volume). Just as we can help address the concerns of receivers by allowing them more accurate control over reception, there are opportunities to help senders more accurately control the way their information is sent. For example, we can give senders the ability to post their message to only a specific subset of friends (or random users) on the mailing list—who can then "up-vote" it and by doing so cause it to propagate to more list recipients. This can give the sender confidence that their email will hit many users only if it is interesting to many users. A small subset can also be asked to act as "friend-moderators", returning a message for corrections to grammar and tone before it spreads further. These friends can also act as "shielders," stripping the identity of a shy sender to protect them from trolls without introducing the problems of full anonymity. Murmur incorporates all these processes in the email environment using replies and forwards.

Of course, when we introduce ways for senders to limit their sending, we risk impacting the recipients who would like to receive more. There are interesting ways to address this. Borrowing from social media, we can permit users to "follow" specific users (with permission) and tags. Such followers would receive all content posted by the users or with the tags, overcoming excessive shyness by the senders. Also, while some of the aforementioned features to limit sending may make *receiving* these particular emails no longer deterministic, this may be a reasonable tradeoff if the sender would have chosen to not post otherwise.

### *Promoting Transparency*

A common thread through our findings was a difference in people's perceptions of circumstances versus what they actually were. We discuss some potential ways to alleviate this with greater transparency. For users that were unaware of the general desire for more discussion, features such as up-voting could serve as feedback to encourage desired content. Tension 3 also uncovered differences in perceptions of how other users handled their email. To alleviate this, we could let users direct messages only to others who have not received too much email from the mailing list recently.

Finally, this study brought up privacy implications in that most people severely underestimated the number of subscribers to the list and most did not know that the list was public to join or had public archives. These issues need to be made clearer to the users so that they are aware of who their audience may be. Additionally, any changes to make archives more readable or searchable or allow them to be crawled could have negative effects if not properly revealed to users. Even though these changes may cause people to self-censor even more, we believe coupling them with some of the other features we have mentioned may mitigate effects.

This discussion only scrapes the surface of possibilities that are opened up by moving away from the opaque filtering algorithms provided by social media and instead giving both senders and recipients more transparent levers for controlling the delivery of information to them.

### **Limitations and Future Work**

We examined only a student and a research-driven mailing list, and surveyed a convenience sample of other mailing list participants, many of whom were students or in academic roles. We did find the survey respondents for *Dorm* and *Lab* matched the demographics of the two primary communities we study, but in general we do not know our non-response bias. Generalization from our data should be done cautiously given how our data was collected. However, we believe our results generalize theoretically [3], in that they will be true for a large number of mailing lists and information environments. We do believe we found some significant groups of mailing list participants who share the perceptions, expectations, and frustrations that we have outlined. In addition, because most of the participants in our interviews and surveys were young enough to have spent many of their formative years using social media, their preference for using mailing lists over social media for group discussion is potentially more interesting than that of a general population.

Many populations were not included in this study—for example, work-related mailing lists. There, different factors such as workplace hierarchy and the culture around socializing may play an important role. As discussed, it would be interesting to contrast mailing list usage with regular email and real-time work communications such as Yammer. Similarly, we are curious how non-work systems might be enhanced or replaced by a real-time group chat interface, such as IRC. Several respondents mentioned using GroupMe for small group discussion, which does for SMS what mailing lists do for email. It would be interesting to study how our

findings translate to text messaging and whether GroupMe could then support larger groups.

## CONCLUSION

Many people still use mailing lists today to communicate within groups. There are now many new systems with new features for group communication, but they have not displaced mailing lists. We studied two mailing lists through interviews and surveys and surveyed 28 other mailing lists to understand why people continue to use them in the face of social media. We also uncovered important tensions within communities: we found that mailing list users within a single community *disagree on the types of content* the list should have; that despite wanting more discussion, *users self-censor* due to real and imagined concerns; and that *how users access* their mailing list email may alter their attitude towards receiving and posting messages. We also made a case for why simply moving to one of the new systems or building a new system outside of email may not be successful. From the issues we uncovered within current mailing list communities, we formulated design implications that could be introduced within mailing list systems in order to alleviate tensions.

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