

Multi-Channel Topic-Based Mobile Messaging in Romantic Relationships

NAZANIN ANDALIBI, Yahoo

FRANK BENTLEY, Yahoo

KATIE QUEHL, Yahoo

With recent shifts from email to messaging apps for personal communication, many communication partners are no longer able to converse using multiple threads within one platform as they used to via email. Romantic couples are the most frequently messaged contacts on mobile and communicate about a wide range of topics with each other, need to make joint decisions, and may have several roles in relation to each other (e.g., spouse, co-parent). Through a 3-week field study with ten U.S. diverse couples we studied how couples use a messaging app that allows them to compartmentalize their conversations into multiple “channels” around topics of their choice. We detail how couples managed and used channels in daily life, and channels’ strengths and limitations. We found that channels made couples feel more organized, and helped with finding content and keeping track of topics. However, it was sometimes difficult to choose or navigate channels. We discuss perceived impacts of channels on relationships (e.g., topic-switching during conflicts), and outline design opportunities for messaging apps.

CCS Concepts: Human-centered computing → Collaborative and social computing; Human-centered computing → Human computer interaction (HCI)

KEYWORDS: Messaging apps; instant messaging; couples; romantic partners; channel; Slack.

ACM Reference format:

Nazanin Andalibi, Frank Bentley, and Katie Quehl. 2017. Multi-Channel Topic-Based Mobile Messaging in Romantic Relationships. *PACM HCI* 1, 2, Article 20 (November 2017), 18 pages.
<https://doi.org/10.1145/3134655>

1 INTRODUCTION

The structures of interpersonal relationships (e.g., friendships, professional, romantic) vary on many levels. As communication technologies have become ingrained into our everyday lives, the ways that committed romantic partners communicate with each other through technology to navigate their lives together is a key example of these differences. Relationships, and particularly romantic relationships, are often multi-faceted. In addition to being romantic partners they may hold multiple roles and responsibilities within the relationship such as managing a household together, parenting, running a business, etc. Couples talk about a variety of topics such as their relationship, plans, families, interests, or finances using a variety of different digital tools.

This research was conducted when the first author was a Ph.D. intern at Yahoo. Author’s information: Nazanin Andalibi, College of Computing and Informatics, Drexel University, Philadelphia, PA; email: naz@drexel.edu; Frank Bentley, Yahoo, Sunnyvale, CA; email: fbentley@yahoo-inc.com; Katie Quehl, Yahoo, Sunnyvale, CA; email: katiequehl@yahoo-inc.com.

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2573-0142/2017/November - 20\$15.00

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Mobile messaging is the most widely used smartphone app category, with 97% of Americans using it at least once a day [40], and romantic couples are the most frequently messaged contacts on mobile [7].

The rise of messaging apps for personal communication has brought with it a new standard for organizing personal messages. Once, email was the most commonly used personal communication tool and it allowed people to organize messages by topic using threads. In mobile text messaging or mobile messaging apps (e.g., iMessage, Google Hangouts, Facebook Messenger), conversations are structured around a *person*, not *topically* like email threads, which allowed people to quickly contextualize and relocate past messages. As messaging has overtaken email as the dominant form of private and direct personal digital communication [5,15], users have lost the ability to manage simultaneous conversations about multiple topics with one person via a single communication tool. Additionally, text and instant messaging are perceived as more immediate than email [37], yet needing to scroll up and up to find a relevant detail might be inconvenient and detract from immediacy. Text messaging and many other mobile messaging services are not designed for multiple conversation threads on different topics with one person, even when they technically afford creating several threads with one person (e.g., WhatsApp, Yahoo Messenger).

Synchronous communication tools like Internet Relay Chat (IRC) or Slack use “channels” to create topical threads of conversation. Although these tools have been used extensively in the workplace and to support online communities of interest, they have not commonly been used or studied in the context of domestic or personal daily life one-on-one communication. We set out to investigate how a messaging app that supports topic channels would be used in everyday life for communication between romantic partners and what the perceived benefits and challenges of using a topic-centric communication tool would be. Romantic partners are a population that are in constant and frequent contact with each other via mobile messaging [7], make joint decisions (e.g., finances, travels, etc.), share a variety of different topics with each other (e.g., kids, work, vacation, etc.), and sometimes may need to reference past content. Specifically, we sought to explore what channels couples create, what existing tensions are lessened with the use of a multi-channel messaging application, and what additional tensions such an application introduces.

Romantic partners provide a paragon target population for studying communication practices. According to Social Penetration Theory [2] those in romantic partnerships are most likely to have reached stages in their relationship in which their communication habits involve more complex exchanges. In comparison with other personal relationships (e.g., friends, house-mates), due to increased familiarity, trust, and intimacy within this type of relationship dynamic, conversations between romantic partners are about a wider range of topics, and include information of more depth and intimacy [11,49]. Romantic partners are also more accustomed to managing conflict and tend to share both positive and negative reactions due to increased honesty and trust. Finally, romantic partners often have multiple roles and responsibilities within the relationship [11,49].

We deployed a messaging app that would allow couples to create channels to organize their communication. We conducted a 3-week field study during which we asked 10 diverse couples to use this app in their daily lives, call into a voicemail diary to report their usage, and participate in a final interview. We show how our participants made sense of the channel feature in personal communications with their partner and how they found or did not find workarounds to deal with tensions experienced as they used this new communication medium. We found that channels made couples feel more organized, and helped with finding content and keeping track of topics and plans. However, it was sometimes difficult to choose or navigate channels. We discuss design implications for messaging apps that meet the needs for both conversation *continuity* as well as *compartmentalization*. Although multi-channel messaging has existed for decades, our study is the first to investigate how a messaging app that allows *multi-channel topic-based* messaging – not supported in major messaging apps – is used “*in the wild*” in *personal* communication. We identify the user needs multi-channel topic-based messaging does or does not meet in different contexts, and why.

2 RELATED WORK

In this section we briefly discuss the prior work that inspired and motivated our study design.

2.1 Messaging Applications

A wide range of work in the HCI community has explored personal communication using mobile devices (e.g., [17,41]). People use text messaging to commence, advance, maintain or impact interpersonal relationships [39]. Ling and Yttri [34] introduced the notion of micro-coordination to the context of text messaging. They studied how working parents used messaging for coordinating family activities: a largely instrumental activity (e.g., picking up children from school). Weilenmann [48] showed how people orient to each other's location, activities, and availability through mobile phone conversations. Grinter et al. [22–24] studied teenagers' use of SMS and instant messaging. Barkhuus [4] argued that SMS increases awareness and accountability, and as such is a “social translucent” technology. Social translucence [16] is a conceptual approach to designing technologies that support better sensemaking about others and their activities in online settings. “Socially translucent” technologies, as first discussed by Erickson and Kellogg, support visibility, awareness, and accountability [16]. Similarly, Nardi et al. [37] studied instant messaging use in the work context and found that it supported awareness, negotiating availability, intermittent conversations, and flexible informal communication.

Regarding more recent messaging apps, Church and Oliveira [9] found that WhatsApp is used more frequently than SMS in Europe because of a lower cost and because messages are perceived to be less formal and more conversational. They suggest that SMS is considered more formal, privacy preserving, and reliable. Another study on WhatsApp usage investigated the benefits (e.g., quick access to information) and challenges (e.g., expectation to respond to messages quickly) of the app [1]. O'Hara et al. [38] suggested that WhatsApp enables digital dwelling – people dwell together in a context that transcends geographic or temporal spaces. We were interested in exploring how one might “dwell” in topic-based channels. Others have studied the use of messaging apps in various domains such as medical teams [29], social movements [32], and education [18,27].

2.2 Romantic Couples and Computer-Mediated Communication

Communication and coordination play key roles in romantic relationships, and are sometimes mediated through technology. Although a variety of coordination tools help people organize their lives, in the context of coordinating activities, people prefer open communication media (e.g., text, phone call, email) compared to structured tools such as sharing calendars [42], since people often want to debate ideas through the coordination process [42].

Researchers have studied “channel switching,” defined as switching communication media during the same communication episode (e.g., face to face to computer-mediated and vice versa), in a variety of contexts. In romantic relationship conflicts, Scissors and Gergle [43] found that people switch between face-to-face and computer-mediated communication to avoid conflict escalation, manage emotions, and reach a resolution. They also discuss how partner's preferences for particular media influenced channel-switching.

Cramer and Jacobs [12] divided romantic couples' computer-mediated communication topics into three categories: relationship/emotionally-salient (e.g., intimate chats), practical needs-oriented (e.g., planning), and representation as a couple (e.g., sending an invitation as a couple). The needs for communicating and reciprocating affective value, adapting to intimate knowledge about the partner and their context, and predicting changes that would make media switching or combining appropriate were among the factors that influenced the choice of communication tool. In non-conflict situations, the main reason couples switched media were practical (e.g., reemphasizing something they already talked about in one app in another one, such as picking up the right brand of cookies from the grocery store).

2.3 Multi-Channel Topic-Focused Communication Tools

As discussed earlier, mobile messaging apps frequently used for personal communication do not afford multi-channel topic-based conversations, and romantic partners often use several apps to communicate with each other. Multi-channel topic-based channels have been available through services like IRC since the early 1990s,

largely used for work and play [25]. IRC allowed people to meet and chat in real time via channels of their choice named after a specific topic. While discussing the extensive body of work related to IRC is outside the scope of this paper, we note that this literature does not address the use or non-use of topic-based channels for personal and everyday life one-on-one communication in non-work contexts. One example of IRC research in personal communication is that of hook-ups and chatting about sexual desires [50], which is different from everyday life, multi-faceted, and personal communication between two people – an area that remains unexplored. A few examples of IRC research in workplace include a study by McCarthy and Boyd [35] that looked at the use of IRC during the ACM CSCW conference in 2004, suggesting that IRC worked as a “digital backchannel” affecting interactions and experiences. Others have studied how a combination of IRC and blogging lead to improved coordination and knowledge sharing compared to email in a distributed firm [30], how software developers use IRC [44], or how information overload limits chat channel community interactions in an IRC network [31].

More recently services like Slack have been used in the workplace. Slack is a popular communication tool that allows multiple conversation threads with the same people. It has been largely adopted for collaborative work (e.g., among software developers, education professionals), and scholarly research has started to understand how it is changing computer-supported cooperative work. Lin et al. [33] surveyed a group of software developers and found that Slack may be replacing email in some workplaces; people use Slack for personal, team-wide, and community-wide purposes. Another study [14] found that Slack’s integration in a team-focused problem-based computer science course influenced the class dynamics, communication between and within student teams, and interactions between students and instructor. These studies did not address one key feature of Slack: topic-related compartmentalization afforded by channels. A recent study [3] analyzed blog posts about experiences with Slack, finding that channels were a desired capability leading to adoption. Slack’s topic-focused channels enabled focus-switching and topic-based organization of communication [3]. Dissatisfaction with email and regular messaging apps were among other factors leading to adopting Slack. For example, bloggers thought existing messaging solutions were too ephemeral and that important information is hidden and hard to find [3]. Beyond tools like Slack and IRC, motivations for switching communication media (i.e., from one app to another) in the work context include supporting coordination, multi-tasking, or being able to discuss a topic too complicated for messaging tools [28,37].

While past work has extensively looked at IRC in work contexts and a growing body of work is looking at Slack, it is important to note that work contexts are different from personal contexts in terms of content, expectations, roles, norms, and the number of people engaged. Research on apps such as Slack or IRC does not explore channel-based one-to-one personal communication beyond the work and professional context. This drove much of our interest in exploring topic-based channels in the context of personal and everyday life communication. As we discussed in the Romantic Couples and Computer-Mediated Communication section above, romantic relationships provide a rich context to study multi-faceted personal relationships, outside the work context. Previous research has given insights about how romantic couples use technology to communicate with each other and how they use a variety of applications. However, this paper examines how romantic couples use a messaging app that affords multi-channel topic-based communication, a previously unexplored research area.

3 STUDY DESIGN, DATA, AND METHOD

In this section we describe our study design, data, and methods. We conducted a 3-week field study with 20 participants (10 romantic couples) to answer our research questions around how couples would or would not use an app that allowed them to compartmentalize their conversations into topic-based “channels,” and why.

3.1 Participants

We used professional recruitment services to recruit a diverse (in terms of age, sexual orientation, cohabitation status, marriage status, relationship length, occupation, and education) sample of 10 romantic couples in committed relationships living in the San Francisco Bay Area and Silicon Valley to participate in our 3-week

Table 1. Field study participants. Text in brackets is to describe what participants meant by a channel name. Pseudonyms for partners within one couple start with the same letter for easier readability.

	Couple 1	Couple 2	Couple 3	Couple 4	Couple 5	Couple 6	Couple 7	Couple 8	Couple 9	Couple 10
P1 gender, age	F, 36	F, 26	F, 40	F, 24	F, 51	F, 47	M, 24	F, 59	F, 26	F, 41
P1 pseudonym	Dalia	Rachel	Kristen	Nadia	Patricia	Alysia	Saif	Chan	Laura	Jasmine
P2 gender, age	M, 38	M, 27	F, 30	M, 24	M, 50	M, 50	M, 23	M, 62	F, 25	M, 38
P2 pseudonym	David	Ralph	Kayla	Neelesh	Paul	Aaron	Santiago	Chi	Lana	Joe
Cohabit?	N	Y	N	N	Y	Y	N	Y	N	Y
Married?	N	Y	N	N	Y	Y	N	Y	N	Y
Relationship length (years)	7	4	1.5	1.5	13	21	2	35	1.2	18
Communication apps used with partner before the study	SMS FB Msngr. Email	FB Msngr. iMessage	Phone call SMS WhatsApp	iMessage FB Msngr. Snapchat	SMS Phone call FB Msngr.	SMS Phone call FB Msngr.	Email Snapchat iMessage FB Msngr.	Line Email SMS Phone call	iMessage Snapchat Phone call	SMS Gchat
Channels created	shopping, scheduling, general, to do list, meal planning, finances, number to call	general, calligraphy, food, our calendar, finances, trips	us, scheduling, house, hunting, social events, gossip, general	sharing content, pulse, check, trip, planning, work, weekend plans	general, confi- dential, update- no money, response, long range, food	the 2 of us, general, events, money, chores, family, shopping	things to do, food, love, britney bitch, general, location	greetings and family, volunteer, chores, travel, recreatio	stuff&things, fdr, [food/drink/ restaurants], affection<3, scheduling	helpline, images, home ETA, [time of arrival], general, 143<3 [I love you], fun

field study. Table 1 includes details about participants. All couples had been together for more than one year and used some type of messaging (e.g., SMS, Facebook Messenger) to communicate with each other on a daily basis and they did not work in the technology industry. Not surprisingly, and similar to the larger U.S. population, all couples used text messaging (i.e., SMS, iMessage) in addition to other communication apps as shown in Table 1 before the study. Importantly, the majority of the couples did not use complicated applications such as shared folders or calendars before the study in their day to day life with each other. Our sample included three non-heterosexual couples and seven heterosexual couples in relationships of diverse durations. Half of the couples cohabited and half did not, but they all saw each other frequently and none were in long-distance relationships. We refer to participants with pseudonyms that start with the same letter for each couple for easier readability. For example, pseudonyms for members of Couple 1 both start with the letter “D” (e.g., Dalia and David). We compensated participants for taking part in the study. All methods were approved by our institution’s review policies for studies with human subjects.

3.2 Set-up Interviews

We began with an initial set-up interview with each couple jointly and asked them about the messaging apps they used to communicate with others and with their partner, their messaging and communication practices, and what they find frustrating or enjoyable in these practices. We interviewed both partners together to build rapport and make sure they were both all set to start the field study.

After this warm-up, we provided privacy and time for participants to individually and collaboratively generate *their* initial channel topics. We asked participants to think about the different topics they communicate about via messaging apps. We asked them to each separately list the high level topical categories

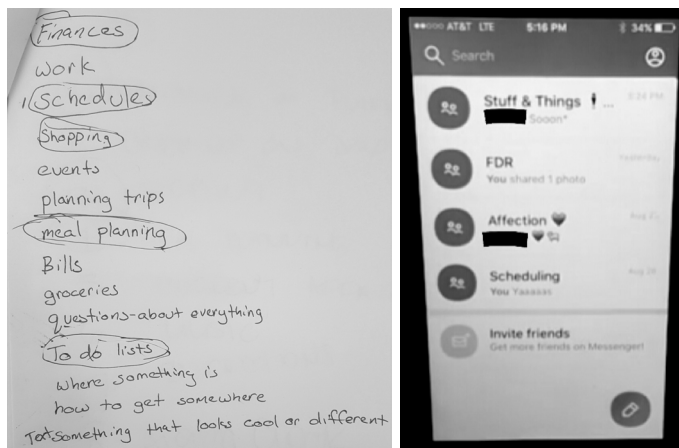


Fig. 1. Initial categories by David (left); four channels on the app by Laura and Lana (right).

they communicate with their partner about on a piece of paper while we left the room (see Figure 1, left). Once they had both completed their lists, we asked them to share and discuss with each other and determine a list of topics to start organizing their communication around together as a couple. Once they narrowed their list to a set of categories, we described the study design: that we were asking them to use an app that allowed them organize their communications around categories through “channels.” We then installed the messaging app on their phones and helped them turn each of their conversation topics into a “channel” (see Figure 1, right). The channels that couples decided on are shown in Table 1. We did not instruct couples to create any specific number of channels. Couples created an average of 5.7 channels (range: 4 - 7). The initial interviews lasted 45-minutes and were semi-structured.

We instructed participants that they could change, add, or delete these initial channels as they saw fit once they started using the app in their daily life. Following best practice from other long term field studies [10], the initial setup and creating an initial set of channels was crucial as we could assure participants could work with the app and channels *while* they were in our lab. This way we could be more confident that participants would be able to use the app and channels, rather than being hindered by potential technical difficulties.

3.3 Diary Study

We asked participants to use the app for as much of their messaging between each other as they could, and not to use it to communicate with other people. We set this second criterion as we were particularly interested in investigating the concept of multiple topic-based channels between close-knit partners. Adding other people such as friends to the app for the period of the study would have complicated the interface, as we simulated a multi-channel messaging app by creating custom “groups” for each of the topics. In an ideal system implementing this design paradigm, channels view may exist under each contact. We asked participants to separately and privately call our voicemail line on Sundays and Wednesdays during the three weeks at their convenience. While they could and may have, we did not ask them to take written notes. We collected this data from participants individually, because we wanted to learn about the experience for each person, as often ideologies and uses of communication technologies are different for members of a couple [19,20]. We provided them with points we wanted them to discuss when they called, and set reminders on their phones. These prompts included questions about the ways participants communicated with their partner using the app; the channels they used during the past few days and why; whether they made changes, additions, or deletions to channels and why; which channels they used the most and least and why; examples of the last message they

sent and how they decided which channel to place it; whether they used any other apps to communicate with their partner, how, and why; feelings and thoughts about using channels; and things they wished they could do with the app but could not.

We provided participants with paper copies of these prompts that they could keep at a convenient location, and also emailed them the prompts after the initial session. The prompts remained the same through the course of the study. Only five participants missed one out of all of their diary calls during the study period. The limit of the Google voice inbox was three minutes. While some would leave shorter messages, others would go beyond the three-minute limit and call several times to share their thoughts. We listened to these entries and took notes about participants' experiences with channels, and probed for details and elaborations in the exit interviews. In addition to informing the final interviews, following best practice from similar long term field studies [10], diary entries also enabled participants to reflect on their experience throughout the study period, and allowed us to monitor how the field study was progressing.

3.4 The Application

We used Yahoo Messenger for this study, a consumer-focused messaging application publicly available for free and compatible with various mobile operating systems. Participants had not used Yahoo Messenger in the past and did not use this app with anyone else during the study. The interface allowed one to create and name a new channel (i.e., "group" in the App's terminology), add a contact, send and receive text/photo/GIFs, and "heart" a message. We chose to use this app over enterprise solutions such as Slack, which could also enable a multi-channel solution, as Slack has a more complex interface and is not designed for general consumer messaging. Yahoo Messenger provided a simple, familiar chat interface with an interaction style more similar to SMS or Facebook Messenger than to an enterprise solution such as Slack.

3.5 Final Interview

At the end of the 3-week period, we met with participants again to ask about their experiences using the app and the channels. This part consisted of a 20-minute interview with each participant separately and a final 20-minute interview with both together. These interviews were semi-structured, and we asked participants to go through each of the channels they had created and talk to us about what they were, how they used or did not use them, what for, why, and what they thought and felt about communicating in this way. We probed to learn how each channel did and did not work for them and the reasons why. We also asked about other tools they used to communicate with each other during the study period and how these experiences compared. We asked each person specific questions based on their diary entries and asked for examples of conversations within each channel. Finally, during the joint interview we asked couples to share what worked well for them as a couple, what was frustrating, and if and how they think using this app influenced their communication and relationship. For example, we asked one member of the couple to share an example of a time that the channels worked well for them, then we asked their partner to comment on what was shared, and for them both to discuss channels within the context of their relationship. We then asked the other member of the couple the same question with discussion following. We repeated this conversation asking for examples of times the channels did not work well. The three phases of the final interview (i.e., individual, second individual, couple) provided us with a coherent and rich dataset that we used for our analysis, as we discuss next. We did not observe contradictions in how participants discussed their experience when they were present together vs. when they were not.

3.6 Analysis Method

All interviews were recorded and transcribed. After transcription, we analyzed the final interview data using a grounded theory-based affinity analysis similar to [6,7,36]. We used exact quotes from participants as the leaf nodes and inductively identified themes and patterns amongst the data, while we built consensus as a team. Figure 2 shows our data organized in themes and subthemes.



Fig. 2. Affinity analysis, themes, and sub-themes.

We did not include the diary entries in this affinity analysis because we instead used them as prompts in the final interviews. Using diary entries as interview prompts allowed us to gain in-depth insights about what participants had said in the diaries, and to uncover things they may not have mentioned in the diaries. For example, if a participant mentioned that they really enjoyed a particular channel (e.g., scheduling), then we brought that up in the final interview and asked them to tell us more.

3.7 Limitations and Considerations

Our study of course comes with limitations. First, while we asked for examples of communication during the final interviews and participants often looked at their conversations on the app while reflecting on our questions, we did not analyze the content of these chat conversations. While collecting and analyzing this data may lead to additional insights, we made the choice to instead ask participants to share what they felt comfortable with during the final interviews. Collecting such communication content comes with obvious privacy concerns. Additionally, we anticipated that if participants felt like their communication content was surveilled, this may lead to behavior that differed from everyday behavior, which would be contrary to our goal.

Second, some participants experienced usability issues (e.g., notifications) related to the app and not channels. While we were not able to avoid such inconveniences we acknowledge that not having had those issues would have led to a smoother experience for participants. Other times, limitations of the app (e.g., non-existing integration with Craigslist) made it so that while participants would have found a “house hunting” channel useful, they were not able to directly add links to it.

Finally, while we instructed participants that they could and should change channels as they saw fit, most participants did not edit channels. This may have been partially due to the fatigue of doing a long term study that requires using an unfamiliar technology. Not deleting a channel may have also resulted from not wanting to lose the content they had shared in those channels; this was a limitation of the app that may have hindered participants who may have otherwise deleted a channel. It is important to consider what would happen to the content in a deleted channel in an app that is designed for multi-channel topic-based communication, and we

leave this for future work. However, we were able to gain important insights about what participants would change the channels to and why, even when they did not in practice do so during the study.

4 FINDINGS

We detail the themes from our analysis here. We discuss how people used, chose, and managed channels in their daily lives. We then discuss the wider ecology of apps and channels, and perceived impacts of using channels on couples' communication.

4.1 Using Channels in Daily Life

First, we discuss how people used channels in daily life and where they saw utility or frustration in the concept of multi-channel topic-based communication with their partner.

4.1.1 Channels are good places to find specific content and keep track of a topic over time

Participants discussed several topics for which channels eased the burden of finding information. For topics such as scheduling, they were able to easily look back without scrolling through other irrelevant information. As Dalia said, "We have to be somewhere at some time all the time. It's really hard to track and coordinate, but it's easy to look through that channel and see what's coming up." Participants also found channels helpful for planning tasks that occurred over time (e.g., planning weekend activities), as Alysia referenced: "When we planned stuff going towards the weekends it was really good. It kept us both on the same page about weekend plans, like we had family reunions these past weekends. It was helpful to use channels for planning." Participants found channels useful for specific, focused topics more so than for general communication.

Participants also found channels useful for managing to-dos such as chores or bookmarking. Aaron found the use of a channel for keeping track of chores to do in the house to be useful, particularly because his wife stopped leaving him notes around the house: "[The] Chore [channel] is basically just stuff that women have men do. It gets redundant because I know what she's going to say and actually with this she stopped leaving them around the house, them little yellow things [sticky notes]. She'll put it on top of the TV, do this, do that... If she wanted me to clean the bathroom, she would put one of the yellow things, but now she stopped that." Finally, participants enjoyed having a separate channel for topics like pictures, food (e.g., planning, special photos, recipes), and kids. Aaron discussed how "with regular text I gotta go through it and find stuff about kids, with this I go right to the kids channel, it's about them." Channels allowed participants to quickly recall information on a particular topic and have a go-to place for communication relevant to the channel topic.

While some participants did not need to go back to find content, the majority found it considerably easier to look in a specific channel to find particular information, compared to what they were used to in regular text or other messaging apps. Ralph said, "There were instances we had to go back to certain channels, like finances or calendar, so it was pretty easy." They enjoyed being able to find things without having to scroll all the way back in a thread past non-related information. David reported liking that "It kept it organized and was much easier than iMessage, because that would've been all of our messages in one thread, and I'd have had to scroll up, up, up." Some made sure to put the content they wanted to get back to in the "right" channel. For instance, Dalia said: "It happens a lot that you have to find something. Like later on when you're doing stuff with your files, and saving stuff on a computer, if you don't organize your files up front, later on it's going to be a big old mess. It's like that now. Being methodical, thinking how to organize it now, is going to be better for us later."

Participants also mentioned channels helped to keep certain information separate from general chit-chat. Chan described the need to separate "important" information from more trivial chat: "I don't want to mix bills with something else. Payment is real and important to me." Or, as Dalia said, "I'm going to keep using this, I consider this for important things not every day chitchat. Great to have something where I can categorize things, not offered with iMessage."

Participants reported that without channels, their messages got lost and buried. For instance, Aaron discussed how compartmentalization prevented him from "losing" content: "I have so many things going on and

it keeps me organized. I'll lose a regular text." Chi, similarly, liked how channels made communication feel less like *"one big blur."*

Participants also found channels helpful to keep track of a wide variety of projects and planning in a dedicated, separated space. Rachel used a channel to keep track of her art project that she shared with her partner for feedback: *"The calligraphy project channel was my main thing. I keep track of my work all the time, and I always ask him to edit it before I post it online. It was very important for me just to keep track, to see the before and after edit versions without mixing it with other stuff."* Channels afforded the separation that some people needed to keep track of particular topics.

However, sometimes it was hard to find things when participants did not remember which channel a specific message was in. For example, for Patricia it was hard to find something she was looking for: *"It was frustrating when I couldn't find something I knew I talked to him about 10 minutes ago, didn't know which channel it was."* Search across channels is essential as people may forget where they put a piece of content that they need to find.

4.1.2 Channels prompt certain types of communication

Some couples had an affection-related channel to use for expressing their love for each other and found it *"adorable"* and *"cute,"* as Lana said: *"It was adorable, we would just say cute things to each other, it's cute to look back in it."* Although they were affectionate in other channels too, they liked having this separate space for it. This channel was also a place to come to for calming down or diffusing an argument: *"If we were arguing, there would be a pause. Then someone would come back in the affection channel and be like: hey this is shitty right now but still love you."*

Channels also suggested certain conversation topics and helped participants think of other topics to discuss when conversations lulled. Neelesh said: *"when you get bored and you don't have anything else to say, it's like: oh we can talk about that trip that's coming up, and you go to the trips channel."* Some channels excited participants, especially travel-related ones. For example, Saif mentioned *"We spent a good week prior to leaving for Vegas going back to the Britney channel out of excitement and talking about it."*

4.1.3 Some channels are more useful than others: a balance between generality and specificity

While not all channels couples created worked well in everyday use, all had a subset of channels that they perceived as particularly successful in organizing conversations, especially for topics that were more specific. A general channel for checking in or talking about things that do not fit into other categories was also useful and all couples had one. For instance, Patricia said: *"General [channel] was pretty much anything that didn't fall into any other category."* Some found channels useful because it kept their communication organized. For example, Aaron reflected that: *"I liked the thing, it's cool and keeps me organized, unlike SMS. I told you, that yellow thing [sticky notes], I don't get them no more across the room because she puts it on Chores [channel]."* He was happy that his wife used their Chores channel to ask him to do things instead of their old method of using sticky notes, which he felt was disorganized and irritated him. Channels worked so well for some couples that they mentioned planning to continue using them with their current or new categories after the study. Overall, a combination of a general channel (used for conversations not pertaining to any specific topic) together with channels about specific topics (e.g., chores, travel planning) was useful for most participants. One challenge that impacted channels' perceived usefulness was that channels were not always used as initially intended, a theme that we discuss in the Managing Channels section.

4.1.4 Messaging is for more immediate or ephemeral communication not worth categorizing or archiving

Some participants did not feel the need to categorize or archive what they talked to each other about over mobile messages. Some do not message each other about things they need to refer back to or things that are *"important enough"* to be achieved and accessible for the future. For instance, Kayla mentioned that all her texts are *"disposable information,"* and her partner Kristen agreed: *"I never go back and look at something I sent her. We don't really text about much that's important."* For them, the way they used messaging apps in general

(i.e., for non-important topics) meant that they would not find using channels helpful either. Another participant, Santiago, did not keep a text history and thought that having channels would be good for others but not for him, because he deletes all his messages regularly; *"I could keep things a little structured so you could go back to that information. With me, I just delete my text messages. I don't try to recall any information, but that's what this is good for, to be able to recall things."* In summary, for people who do not archive their messages or do not talk about topics important enough that they would want to archive, channels were more of a burden than a joy.

Overall, channels prompted certain communication types, were useful for keeping track of topics, finding content, and for more specific topics rather than general chit-chat.

4.2 Choosing Channels

We describe participants' processes for choosing specific channels, or switching between channels in a conversation.

4.2.1 Learning how to use channels takes time

Naturally there was some getting used to a new app in general and to channels in particular, mostly because people were used to single-threaded communication tools, such as regular text or Facebook Messenger. For some participants, at first it was not clear what should go in a channel, but they soon got the hang of it. For example, Dalia said: *"At first it was frustrating to think where should I put this in, then it was beneficial because I was more mindful and did not say stupid things to him. I think I was trying too hard at the beginning like it was a test, but now it's easy."* Using different channels became more fun and useful for some as time progressed. For instance, Saif said: *"Towards the end, it kind of just got fun. Towards the end it felt more organized. We can put food here, we can talk about our love here, things to do on our vacation, things like that, especially our vacation. It got easier at the end."* This in part indicates how over time participants' perceptions and use of channels also evolved.

4.2.2 Channels overlap or are too granular

Some participants thought that they had more channels than necessary. For instance, Rachel reflected that: *"It was too many to keep up with, if we had 3: like general, calligraphy, and food or trips I'd be more inclined."* Sometimes people had channels that they found overlapping or loosely defined in practice, and that made it challenging to choose a channel to post in or find information. For Chi, these gray areas were challenging: *"It's not perfect as we have gray areas, cause some stuff may be overlapping like travel and recreation channels."* Relatedly, a recent study [8] found that people who manage multiple email accounts for different purposes often have difficulty finding or filing certain information due to the permeable boundaries between these accounts. Although we had instructed participants to rename, add, or delete channels as they saw fit, perhaps guiding them in creating a workable number of channels could have helped with these issues; however, we now have empirical evidence that too many channels are challenging, but more than one channel is often appreciated. Similarly, our findings indicate that channels should not overlap with each other or be too granular to be deemed helpful. Couples who use channels in practice for an extended time period will likely find the optimal balance of channel granularity over time.

4.2.3 Channels are sometimes too much effort

Sometimes participants felt channels were too structured for everyday chat and needed too much effort for little added benefit. In her reflections, Lana questioned *"how important or relevant does the conversation have to be to this channel that you put it in there."* Additionally, for some, channels were too much cognitive effort; for instance, Kayla shared: *"It's an extra effort when you open your app to try to think how you should categorize your message, sometimes you just want to be quick. But you have to start thinking rather than typing your thought right away."* The need to think through what channel a fast exchange should go in, before even typing it, was not worth the effort for some participants.

4.2.4 *Conversations naturally move between topics*

Some participants mentioned that one conversation session for them often involves more than one topic, and that switching channels was not “natural” for them, or that they did not want to have multiple conversations at once. To this point, Alysia said: *“If I’m just talking, I may be thinking about multiple things, and I would not stop and go into another channel. It’s not natural to just stop and say oh, I’m starting a new subject, it’s just not flowing.”* When having this continuity was a concern, participants would not switch channels or would respond to a message in a channel they were already in when their partner messaged them in a different channel, in an attempt to keep the conversation flowing and seamless. Flow is a concept originally introduced by Csikszentmihalyi [13] and has been adopted in the HCI domain as a way of assessing user experience [21,26,45,47]. This finding indicates that flow is important in modern messaging user experience and designing messaging experiences that allow topic-based channels.

4.2.5 *Channels require deciding: categorize then type, or type then categorize?*

Interestingly, most participants reported wanting the ability to move content across channels after they sent them because they had a better idea of what the content was after typing it, because their conversation topic changed, or because they thought they “misfiled” it and it would be a better fit for a different channel. For instance, Dalia shared that: *“Sometimes we are just talking about bullshit. Then it ends up being like hey, there’s this festival. It’s not really scheduling because we’re just brainstorming. But later on, if I can actually move that when we know we’re going to the festival, it would be super helpful.”* Typing and then allocating content to channels may make choosing channels as well as channel switching easier by allowing people to think about their content more. Alysia elaborated that: *“I may not have a particular channel or topic in mind, but once I finish typing I’m like okay this goes here.”* However, if one allocates messages to channels immediately after they send them in a back-and-forth chat, it may slow down the conversation, as Laura discussed: *“It would help choosing the appropriate channel to which it belongs but if it’s a back and forth conversation I feel it will just slow everything down.”* Overall, some participants described thinking that putting messages in channels after typing may make it easier for them to choose channels, and may make them better appreciate the benefits that channels offer.

Tensions arose when choosing a channel required extra cognitive effort, such as when one wanted to be quick, could not predict a message’s topic prior to typing, could not easily fit the message into any or just one channel, or changed topics mid-conversation.

4.3 Managing Channels

Channels required careful management, and were not always used as expected. Here we examine how participants managed their channels in practice.

4.3.1 *Channels are not always used as expected*

During the field study some participants did not use some channels they had created as much as or how they expected they would. Factors influencing unexpected uses included not being in a situation where the topic was needed, the partner’s perceptions of a channel, and a channel’s scope influencing its perceived usefulness.

The first reason for not using channels as expected was not talking about the channel’s topic as much as they initially anticipated. As Dalia put it, *“Meal planning, in the beginning was what we were going to eat for dinner, but we haven’t really been eating [at home] a whole lot, so we didn’t need to talk about it.”* In other cases, participants thought they would use a channel for one purpose (e.g., recipes), but in practice they used the channel differently (e.g., all things related to food.)

Importantly, some realized first hand that their partner’s perceptions had a key role in their experience using the channels. One reason for this was the need to have buy-in from both partners on a channel’s value and utility. For example, Lana said: *“Part of it is all about bringing her on board with it. I’m definitely all about having most of the categories and... I want to talk about all these different things in different channels; for her it’s*

easier to just have one. I could maybe convince her of its utility." Other times, specific media ideologies of one member of the couple (e.g., deleting all text messages in daily life when using iMessage before and after participating in the study) made it so that the couple would find channels less useful for them, even when one member of the couple did find channels helpful. Santiago said: *"With me, with my text messages, I just delete them. I don't usually try to recall any information that I needed to but that's what this is good for, to be able to recall things that you were talking about."* In order for a technology to work for a couple, it has to work for both members to some extent. In other cases partners had different perceptions about the channels. Chi reflected: *"she [Chan] is not rigorous about it. Sometimes she would just forget to really think about what channel she should really be in and would type it wherever."* Gershon [19,20] developed the concept of "media ideologies" to describe the way that different perceptions about technology contribute to how people adopt them and make sense of them. Yet couples do not always share media ideologies [19,20], as we also found. A shared awareness and understanding of what a channel is about and its utility was key to using channels as the couple initially imagined and expected. Sharing broader media ideologies (e.g., sharing a value of archiving content) was important for channels to work for couples.

Finally, participants reflected that creating useful channels requires thoughtfulness, and some realized in retrospect that they had not created the most useful channels (e.g., due to a lack of specificity). As David shared: *"I would probably change the category topics to something day-and-night different, not real close to each other."* Participants' reflections pointed to the utility of channels for things they may want to reference in future. This is illustrated by Patricia's point: *"If we wanted to keep track of something. Let's say we had a kid seeing a doctor. Now this is what happened before, this is the medication change, and here's the reaction. We can look back and say: we need that reference information to know what's going on over here."* Others thought channels would be useful for more specific messages (i.e., content type such as links, images, directions or specific tasks or topics). For instance Dalia said: *"I would use this [channels] better more as tracking tasks, like our taxes, monthly receipts or a place to keep what is on our craigslist."* Those who thought some of their channels were not the most appropriate for them had reflections about channel topics that they would indeed find useful and relevant in the future: mainly topics that are specific enough and not too close to each other, and need to be archived and referenced in the future.

4.3.2 Changes to channels

We had instructed participants to rename, add, or delete their channels as they saw fit during the field study. Some couples made changes, but most did not. For example, Rachel deleted their Pokemon Go channel because she got tired of talking about Pokemon Go and instead created a calligraphy channel to focus on her calligraphy projects. Additionally, some participants reflected on the desire to combine some of the channels, although they did not. On this note, David said: *"I think we could have merged scheduling and dinner planning together."* Participants learned how they could revise their channels to better meet their needs.

Overall, managing channels required flexibility to support shifts in perception of channel use and the actual practice of using the channels – both in the channel structure of the messaging platform and within the channels themselves.

4.4 Wider Ecology of Channel Use

4.4.1 Channels may replace parts of a wider ecology of apps

We asked participants to use the app for as much communication between them as they saw fit in their lives. Participants described how using the channels made them realize how they used various apps to compartmentalize their communication before the study. On this note, Neelesh said: *"If we're ranting about work, that we do over text or Facebook messenger. Planning trips is with Google docs. This time, we used your app to brainstorm the trips on the trips channel. It's interesting we already segregate the information without thinking about it."* Not surprisingly, participants also used other apps during the study. Reasons cited for doing so included needing to include other people in a group chat, features (e.g., Snapchat for videos), habit, and already being on an app (e.g., using Facebook Messenger because they were already on Facebook). For each couple,

these additional apps used during the study were the same apps they had mentioned using before the study, as seen in Table 1, and did not include apps that use third party permissions or complicated tools (e.g., Dropbox folder). Other limitations that influenced using the channels included not being able to send content from other apps directly into a channel (e.g., Craigslist link into a house hunting channel) or not being able to create an event in the calendar from within a channel (e.g., calendar channel).

4.4.2 Channels may differ for work vs. personal contexts

Some thought that the channels would be great for work contexts as well as or in contrast to personal relationships. For some it was because the focus was more clear in work contexts; *"I think you can pinpoint the focus of a conversation in business relationships more than in our relationship,"* said Patricia. For others it was because of the difference in the amount of information that needs to be organized. Kayla elaborated: *"Professionally, there's a bunch more communication. So many projects. But in my daily life I don't feel like I have a ton of things I need to organize."* Tools like Slack employ channels in the work context, as we described in Related Work. Slack's topic-focused channels support focus-switching and topic-based organization of messages [3]. The insights from our study show areas where channels could be helpful in personal communication as well. Additionally, the tensions we pinpoint here may also occur in work contexts, an area for future research.

Overall, the topic-based compartmentalization afforded by channels may replace *parts* of a wider ecology of apps, although people use a variety of apps for several reasons. In the wider life context, channels may be helpful for business relationships in addition to personal relationships.

4.5 Perceived Impacts of Channels of Couples' Communication

Some couples did not observe any differences in how much or what they communicated about with each other. However, some participants perceived changes in communication style, practices, and interpersonal dynamics. For instance, Chi shared: *"I understand her better... Also, she says things now that she would not before, and it clarifies things. Before this, we just assumed things."* Some noticed an increase in active, clear, specific communication and more interpersonal understanding. While aspects of this finding may be a product of the study setting, we cite examples of participants' comments about their perceptions of how channels impacted their communication.

Some reported their communication was more thoughtful, organized, deliberate, and meaningful due to channels. Channels made people more conscious and purposeful about their concerns, because they had to think more about what they were going to say. For instance, Neelesh said: *"Sometimes, I over share with her just because I like telling her things. Sometimes, she's like, 'I don't care about this.' [Channels] made me able to put one more layer of filtering in my initial thoughts to what I communicate with her at the end of the day. It was more deliberate."* Dalia also discussed the ways channels increased reflection around communicating: *"It is more meaningful... it's training your way of thinking, and communicating. It is more thoughtful; you have to take a step back and see what channel. I liked having to think twice about things. That's when it started expanding my mind. This is really helpful."* By using channels, couples were able to engage in what they perceived to be more meaningful communication.

Sometimes participants used channel and topic-switching during conflicts and arguments to keep communication lines open. Neelesh's reflection illustrates this point: *"We have this habit whenever we argue, we switch to a different communication app. Let's say, we're on Facebook Messenger and I say something she doesn't like but she still wants to talk to me, she'll send me an SMS about something else completely. It's a way to switch the topic while still communicating. The channels did that for us. There were different screens and the built-in functionality of like, 'I don't like what you're saying. Let me physically change the topic by changing the channel'"* In this way, channels afforded "topic-switching" and supported couples during conflicts. Previous work [43] has also found that in-conflict couples switch between media (e.g., face-to-face, text messaging) for avoiding conflict escalation, emotion management, and reaching a resolution. In our study, having multiple channels within the same app helped couples to keep the lines of communication open, by active "topic-switching,"

instead of fully switching to another app. Finally, for some, using channels enabled reflection about what they do and do not communicate about in their relationship and whether they want to make a change.

In summary, channels influence relationship dynamics by mediating conflict and affording reflexivity through explicit declaration of a topic or deliberately switching topics (by switching channels). Our work provides a first step in understanding how communication technologies could be designed for romantic couples to meet the following needs *in tandem* by employing channels: 1) easy access to certain past content or keeping track of certain topics, and 2) improved reflection on and potential satisfaction with one's relationship due to increased clarity and communication thoughtfulness during and outside of conflicts. Our findings suggest that channels are a promising feature to explore in order to design messaging apps that support users' complex communication needs simultaneously.

5 DISCUSSION

People use a variety of apps including social media (often one-to-many) and messaging apps (often one-to-many and one-to-one) to communicate. Previous work [12] suggests that couples do not necessarily *prefer* using multiple apps, but do so for practical reasons such as added meaning or emphasized importance (e.g., “*don't forget to get milk*”). Similarly, when Alysia stopped using post-it-notes for chores around the house, Aaron did not forget what he needed to do because the content in the “Chores” channel was more persistent and visible than the paper note, both were held accountable for what they agreed on, and coordinating chores was less frustrating. Using channels allowed for more visibility, accountability, reflection, and awareness between partners compared to other means of communication they were used to. As such, we argue that channels make for a more “social translucent” [16] technology compared to apps which allow only one-threaded conversations with one contact. Using channels within one medium seems to meet the need for keeping the conversations that one wants to keep track of, or wants to separate from other general conversations, within one platform. This reduces the likelihood of miscommunication or missed messages.

Overall, participants found channels useful for a wide variety of purposes in their daily lives, and benefited by having places to reduce tensions in relationships or easily returning to important information. While not every channel created was perceived to be helpful by participants, observing people attempt to use channels in their daily lives for 21 days has given us substantial understanding about where and how this type of system works, and where and how it does not. For example, specific topic-based channels were helpful for planning tasks that occur over time (e.g., planning weekends), keeping track of a specific and focused topic over time without mixing it up with other content (e.g., calligraphy project), or finding specific content as needed (e.g., what to do today for chores) rather than general conversations. Channels helped with communicating affection and keeping the connection open in times of inter-personal conflict as well. They also prompted certain conversations (e.g., providing discussion ideas) and elicited reflection on one's relationship.

The insights from this work has implications for work contexts, especially as research on multi-channel topic-focused communication tools (e.g., Slack) in the context of work is growing. Relatedly, recent research [3] using blog posts about experiences with Slack suggests that Slack users appreciate focus-switching and topic-based organization of work-related communication afforded by channels. They also find retrieving relevant desired information to be easier in comparison to other tools. Our findings resonate with this prior work in that using channels makes it easier to find specific information one may be looking for or to keep track of specific topics or projects over time. We also provide important insights about other uses of channels (e.g., channel-switching in conflict) as well as challenges (e.g., channels with overlapping topics, tensions between flow and organization, need to allocate the message to a channel after typing or sending it) that may also apply to contexts beyond personal and romantic one-one-one communication. For example, it would be interesting to see if channel-switching in conflict is also prevalent or effective in work settings. Our analysis points to insights about the differences and similarities between personal and work contexts. For instance, as we discussed, Patricia stated how it was hard to find the focus of conversations with her partner, in contrast to her co-worker. Therefore, it is possible that choosing channels may be less challenging in work settings for

some compared to personal settings. Future research could specifically explore these different uses for example by recruiting participants who use Slack or IRC for work, and see how uses and challenges would be different or similar in personal relationships. Next, we discuss our design implications.

5.1 Design Recommendations

Based on our findings from exploring multi-channel, topic-based communication behaviors, we present design recommendations for systems supporting multi-channel topic-based communication.

5.1.1 *Support channeled messaging to meet users' need to organize conversations*

Participants found using channels useful for organizing specific tasks or topics, or things they knew they needed to get back to, in addition to having a general channel for what would not fall into the channels or what they would not feel is "important enough" to categorize. Systems that support channeled messaging should help users choose topics that best fit the benefits of channels, such as planning, travel, child-related tasks, and to-dos. These specific channels can further serve users with additional functionality such as checking off items, re-ordering messages/to-dos (e.g., changing a message's position in a channel for more emphasis), saving messages for later with reminders, and integration with other apps (e.g., calendars, Craigslist).

5.1.2 *Support easy access to channel-switching controls*

We observed that topics sometimes switch throughout the course of a conversation, and in some of these cases participants found it awkward or unnatural to move to a different channel. Previous work suggests that people prefer open communication media such as text or phone call compared to more structured tools (e.g., sharing calendars), because the openness affords discussion [42]. Systems that support channels should make it easy to switch between channels on a single screen, perhaps with a pulldown or tabs, such that navigating to a list of channels and back into another conversation is not necessary. Defaults are important in user experience. Messaging systems should default to a general channel for most daily communication needs and facilitate channel-switching in order to maximize the utility of channels and minimize cognitive load.

5.1.3 *Support flow and organization via manual or automatic allocation of content to channels before or after typing*

Channels sometimes put organization at odds with continuity, or flow. Flow [13] is important in messaging systems, because it makes communication more effective [46]. Though people appreciated the organization afforded by channels, sometimes segmenting communication into channels was burdensome when topics switched mid-conversation, a message was not easily categorized in advance of typing, or when a message could belong to more than one channel. We suggest flow and organization do not need to be at odds. A system could automatically allocate content to channels or provide channel suggestions, enable choosing a channel before *or* after typing a message, and allow users flexibility to move content between channels. Similarly, tags can be used to facilitate filing and finding messages. If users are on board with automated techniques, classifiers could move conversation segments into appropriate channels based on message content or tags. For instance, travel, food, or schedules are fairly easy to train a classifier on, and were some of the most commonly successfully used channels in our study. Such features would help maintain organization while preserving flow by reducing the burden some perceived in making decisions before typing or switching channels mid-conversation. Such design features would place content in the "right" channel even if users change their mind or realized they "messed up" when choosing a channel. In this way, a system could support the organization *and* continuity that people appreciated. Designers may consider these ideas for building messaging apps that allow people to keep context, flow, and compartmentalization together.

6 CONCLUSION

We conducted an empirical study about how romantic couples use messaging apps to communicate with each other, and how segmenting communication topics through “channels” affected their communication experience. We studied multi-channel topic-based messaging for personal communication for the first time, focusing on romantic couples as the context. We found that using multi-channel topic-based messaging apps help couples feel more organized, keep track of topics, and find content more easily, yet brings up challenges around choosing and navigating channels, which can disrupt flow. We provide novel insights into what messaging could be like: organized and efficient, without sacrificing flow and continuity.

ACKNOWLEDGMENTS

We would like to thank our participants. We would also like to thank the UXRA team at Yahoo for supporting this research. We are grateful to Oliver Haimson, Andrea Forte, Michael Dickard, and Tim Gorichanaz for feedback on prior drafts of this paper. Finally, our thanks to the anonymous AC and reviewers for helpful comments on this work.

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Received June 2017; revised July 2017; accepted November 2017