

Momento: Using Mobile Technology to Facilitate Gratitude through Memory Documentation Among Couples

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ABSTRACT

Our journey began with the core idea of developing an application that would facilitate positive dialogue, openness, and connection between people. Through domain research and need finding activities, our ideas rapidly evolved. By keeping open minds and listening to users, we moved from an initial idea of connecting strangers for meaningful conversation to facilitating conflict resolution between romantic partners to our eventual idea that holds real promise: Momento, an app that helps couples document happy memories and consistently practice gratitude for their partners. After conducting a review of literature and related applications, our team conducted a series of usability tests on paper and mobile phones, ultimately culminating in a final ten-day field study with a functional prototype. At the end of the field study, the analyzed results provided implications into the application's design itself, in addition to general insights about building applications for couples.

Author Keywords

Communication; memories; gratitude; mobile; positivity; appreciation; relationships

ACM Classification Keywords

H5.m. [Information interfaces and presentation (e.g., HCI)]: Miscellaneous

RELATED WORK

Our starting domain interest and research focused on “facilitating meaningful connection.” During our initial exploration, we reviewed several applications and research papers on app-facilitated interaction, learning:

1. While anonymity encourages individuals to be more open about deeply personal topics, the dialogue it produces rarely gets deeper than superficial responses.
2. Public sharing encourages people to present false impressions of themselves.
3. The presence of personal mobile phones during in-person conversation tends to reduce the quality of dialogue and empathy between conversationalists.
4. When all parties commit to using technology to structure an in-person conversation, it can

potentially improve communication and balance talk time.

One application we studied was Whisper [1], which allows individuals to anonymously post information about their lives and express feelings into a public forum. Analysis of posts revealed that users primarily use Whisper to find hookups and drugs, to troll others, and to express hateful ideas. While the idea of giving people a space to express their most private thoughts and secretive desires seems valuable, in practice, the anonymity led to rampant misuse. While Vent [2] and Paralign [3], two other applications that we reviewed, managed to avoid the most serious pitfalls of Whisper, they both failed to support ongoing and meaningful dialogue. Paralign, despite its success in making people feel comfortable divulging highly personal emotions, is not a space where thoughtful posts lead to back-and-forth conversation. In fact, it is common for Paralign users to express suicidal thoughts and then to receive several encouraging, but inevitably short one minimal responses like, “Things will get better.”

GENERATIVE RESEARCH

Through our initial research, we became increasingly convinced that connecting strangers and allowing anonymity would not facilitate the most meaningful dialogue. We decided that a better strategy would be to focus our energy on understanding the dynamics of couples, how they handle conflict, communicate, and record experiences. The final research questions that we decided to test with our study were as follows:

1. What strategies do couples tend to use when conflicts arise? How frequently do they use them? Could a technology-based solution facilitate these strategies?
2. Do couples regularly encounter novel types of conflict, or do they tend to revisit old conflicts repeatedly?
3. How do individuals think through problems and potential conflicts in their relationship?
4. How do couples document their conflicts and process them over time? What value do they get out of documentation?

5. How do couples feel about a mobile application facilitating their conflict resolution and/or their tracking of good and bad relationship experiences?

Methods

We recruited a wide variety of individuals to participate in the study. We relied on two criteria:

1. The individual is currently in a relationship
2. The individual and their partner live in the same general area and interact regularly

Our team utilized connections from Stanford and our hometowns to recruit participants. Within Stanford we found participants a few links removed from our friend groups. Ultimately, we assembled a diverse set of participants, from those married for over 25 years, to young adults and college students in month-old relationships.

We conducted user interviews and diary studies to produce our generative research, interviewing eight participants and conducting diary studies with seven participants. The diary study was conducted over five days. Participants filled out a form daily that asked them to detail their feelings about their relationship that day, if any conflicts occurred, and if so how they were resolved. Our interviews centered around the research questions mentioned in research criteria. Namely, we focused on examining how participants communicate with their partners, how they resolve conflicts, and how they document thoughts and experiences. If the user being interviewed took part in the diary study, we also asked some follow-up questions about their experience. Additionally, we did additional literature research to backup answers to our research questions.

Findings

In this section we will explore the main findings that we gathered from our generative study that ultimately led us towards building Memento.

Most couples saw value in journaling, but were discouraged because it always became negative.

Most couples in our study had once considered it valuable to journal about their relationships - they all tried it at some point - but most were discouraged when they found themselves only focusing on the negative aspects of their relationships. "There was also like a relationship component of journaling, which at the time really did focus on just the negative... Looking back on that I'm not totally stoked about how that went down and so [I'm] more reluctant to do that."

This point really caught our attention, as it seemed to point towards a theme in which users really got tangible value out of writing about their relationship, but without extra structure or a guide it devolved and became hurtful. From this, we immediately thought that there exists an opportunity to change people's relationships with documenting their thoughts and memories - helping them

remember the good ones and share those moments with their partner. One of our participants directly said, "I think it'd be valuable to document... moments when like people feel really happy or valued or respected in a relationship... how two people, you know, work together well and what things they do that delight each other and like show respect for each other."

People want reminders of past happy memories

In a number of interviews we noticed that users fondly remembered happy memories of themselves with their significant other, often without any prompting. This was especially true when the memory was connected with a specific memento, like a cat toy or a plushy. In one interview, a participant was remembering a time she and her significant other went to a night market together. Without any prompting, she suddenly stood up and grabbed a plush cat off of a shelf. With a lot of excitement and glee, she said, "I got him a Pusheen, from the time we went to the night market. He carries it around." Her excitement and perceived happiness surrounding remembering this event really caught our attention. In another interview, a participant said "...look at that little cute cat up there. So I had this that I brought from home [holds up cat toy], and then he got me this cute little cat here from when we went to Japan Town. I think about that time." Individuals really seem to get a lot of value out of being reminded of good times, especially when those good times involve loved ones. Concrete objects that people can look to and interact serve as special reminders.

Frequently expressing gratitude and strong relationships make people happy

A majority of our additional literature research focused on positive psychology. Decades of research in this field has consistently shown two major findings: strong relationships and frequently expressing gratitude makes people happy. Something as simple as stating five things you're grateful about - just once a week for ten weeks - was shown to make people feel more satisfied and optimistic. The Harvard Happiness Study - which followed 724 men for about 80 years - showed decisive evidence that relationship quality is critical. Their best predictor of happiness was how much you give and receive love. From PsychCentral's 'The Relationship Between Happiness and Gratitude,' "Lyubomirsky's research demonstrates that expressing gratitude has several benefits. People who are grateful are likely to be happier, hopeful and energetic, and they possess positive emotions more frequently. [4]" From Harvard Health Publishing's 'The Secret to Happiness,' "The Harvard Study has found a strong association between happiness and close relationships like spouses, family, friends, and social circles. 'Personal connection creates mental and emotional stimulation, which are automatic

mood boosters, while isolation is a mood buster,’ says Dr. Waldinger. [5]”

Study Takeaways

We were surprised to learn that our second topic (relationship tracking) had more potential for product development than the first (conflict resolution). By interviewing a series of couples about their conflict history, we discovered that many people have incredibly different personal definitions of conflict, and ways to solve these different events vary greatly. While some people found that taking a logical, empathetic approach at immediate conversation proved fruitful, others felt that taking time apart to process was the ideal way to solve their problems. Many individuals, in addition, reacted negatively to the thought of utilizing an electronic communication device to process conflict, and our team decided that the various emotional states of people in the midst of conflict would be difficult to account for in our design.

Thus, we saw a large opportunity for supporting couples in recording their experiences in order to process and document them, but to do so with features that promote positivity and gratitude. Such an application would agree with the growing evidence that expressing gratitude makes people happier, and that strengthening relationships is a major predictor of long-term happiness and health.

APP AND USABILITY

App Concept

Drawing from our background research and interviews, we decided to build a platform called Momento. Momento is an application that enables couples to build timelines of meaningful experiences called moments that only they can see. Through this private and shared timeline, couples will be able to document feelings and shared events while also remembering past ones - strengthening their relationship through reflection and gratitude.

We chose to target young adults aged 18 to 35 who are in monogamous relationships and who find value in using social media to build relationships. We came to this decision based on information from a Pew Research report, that found that 88% of Americans in this market regularly use social media. Further, over 60% of them use image-based social media such as Snapchat and Instagram daily. Momento’s core functionality is based on memory sharing through images and captions, so we expected our target market to be strongly drawn to the app.

Although some of the planned usage cases were modified based on user feedback, many features, and the core function of the application remained the same throughout usability testing.

Initial Paper Prototype Design

The initial prototype developed by our team was relatively disconnected, having many different and independent flows

for different use cases. There were four total user flows that we tested:

1. User logs in, views their timeline, and adds a moment to it (See Figure 1).

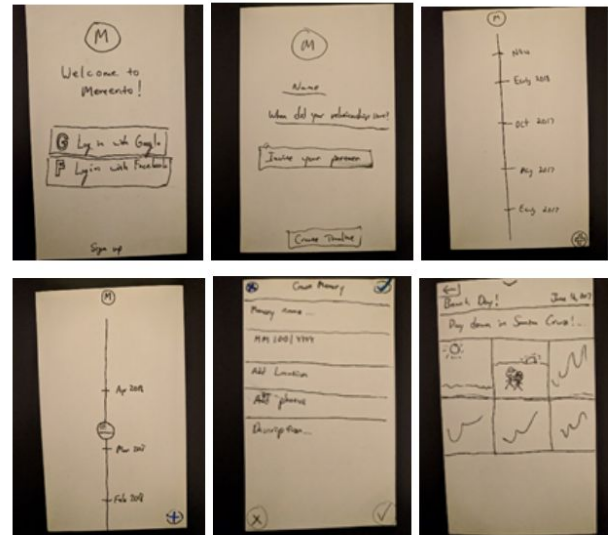


Figure 1. User Flow 1

2. A user receives a push notification, that then takes them to a page where they can write a moment about their partner in response to a prompt (See Figure 2).

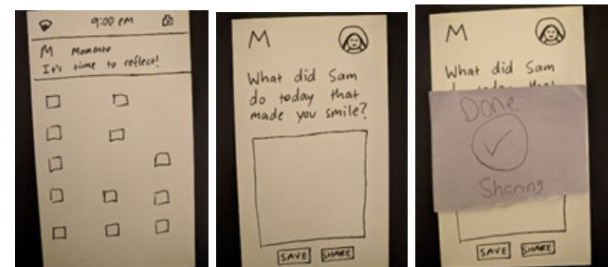


Figure 2. User Flow 2

3. After completing a positive message about their partner, a user is prompted to enter in a message directed toward their friends (See Figure 3).

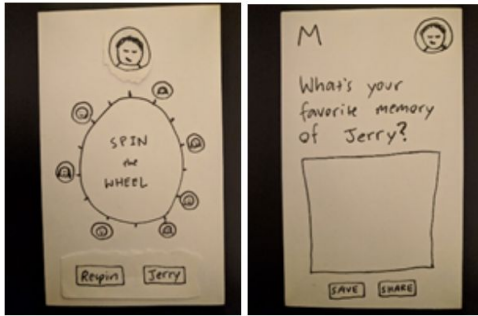


Figure 3. User Flow 3

4. The user receives a push notification from the app prompting them to view a moment written by their partner (See Figure 4).

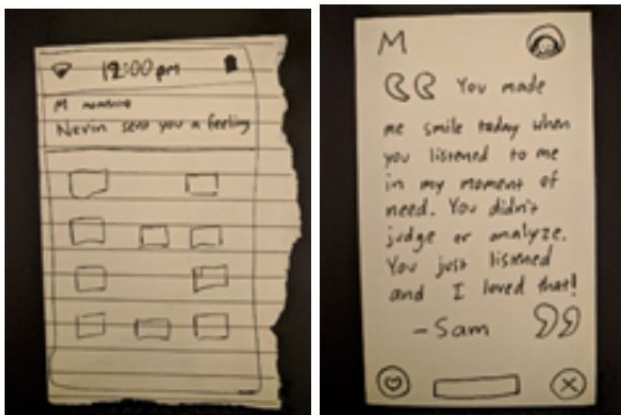


Figure 4. User Flow 4

Paper Prototype Usability Study & Key Findings

Our team decided to test out a few features of the application that we believed were critical for user interaction. These features included:

1. Create a "Memory"
2. View a "Memory" on timeline
3. Create a "feeling" when prompted via push notification
4. Viewing a "feeling" message from partner via push notification

In addition to studying these features, we also tested basic experiences such as creating an account and alternative features outside our core interaction loop, such as communicating gratitude for friends. To test the paper prototype, we recruited a group of five students and young professionals, between the ages of 20 and 30. Our key findings, planned changes, and implemented changes were as follows.

Finding 1

Our initial users expressed a clear need to marry the two types of input screens: "create memory" and "create feeling." Users clearly desired consistency among the screens where they added content to their timelines. Some users got confused in the "quote screen" box and how it was distinct from the add memory screen.

As a result of the large amount of user confusion, we decided to create a single "moment" screen for adding moments, that encapsulated both the add memory and add feeling screens. We hoped to create a highly customizable screen, allowing users to determine which features of a memory they could record, making that screen suitable for all situations (See Figure 5).

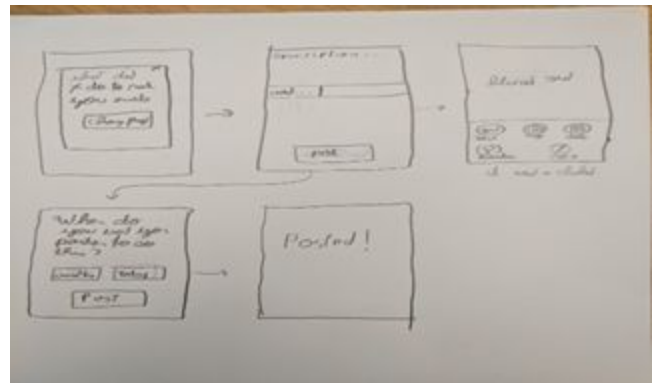


Figure 5. "Add Moment" Screen Redesign

In our final application, after more thought, we did merge the "add memory" and "add feeling" screens. However, dismay was expressed by potential users at number of clicks necessary to moment with the custom fields of the display; because of this, we decided to create a single screen, with a number of predetermined fields (date, title, description, and images).

Finding 2

There was confusion around the functions of "save" and "share" on the screen where users document feelings. The intention was that "save" would put the moment on a pair's shared timeline and "share" would both place the memory on the timeline and send the moment as a message to one's partner the next day. Users generally did not know what would happen if they clicked either one.

Our team initially determined that a good fix would be to re-label the buttons to make their functionality more clear.

After much internal deliberation, the team made the decision to remove the sharing/saving options entirely. Every message and post created would be delivered directly to the shared timeline. While journaling applications exist, we created Momento with the idea of it being a shared application, where partners reflect on and share positivity with each other. Because of this mission, and the large amount of user confusion surrounding it, we ultimately decided to scrap the "save" feature.

Finding 3

Users want the power to manage their relationships. Many users expressed confusion about what happens if their relationships end- ultimately leading to the desire for users to have the ability to create new relationships and perhaps even archive old ones. Users also wanted to be able to create timelines with close friends in addition to their romantic partners.

Our team decided to develop a “manage relationship(s)” page. On this page, people would be able to designate who their partner was. We also decided to explore giving users the option to add a small number of close friends through this page.

We built the application so that every user has a default timeline; and every user can invite any number of users to have access to this timeline. Due to the structure of this program, a user can have access to multiple timelines of friends, family members, and romantic partners. In addition, groups may share access to a timeline. With this implementation, we hoped to provide users with the appropriate structure to manage their relationships with others.

Finding 4

Users want control over timing of reminders and messages. Two user testers claimed that they “hate” push notifications and almost always turn them off. One of these two users seemed more amenable to reminders via push if they had the power to dictate exactly when they came. In general, users expressed that having some power over when their partners are delivered their “feelings” was appealing.

In order to combat this, our team decided to implement a system of customizable message preferences. When users initially created their profiles, they would be given the option to set their reminder schedule about writing “feelings” from the day. They could dictate both how often and what time the reminders came. The same could be done for setting a consistent time for their “feelings” to be sent to their partners.

We decided not to implement timed push notifications. Instead, we choose to send notifications out at a clear and consistent time daily. While the reasons for this were technical in part, we also thought that it would be interesting to observe how users respond to getting a prompt that they could read at the same time every day. Potentially, we hoped, it could be something that users began to look forward to.

Finding 5

Users desire clear, consistent interaction points with our application. The interaction points should be internally consistent, and consistent with the design guidelines of the operating system. This means that if a plus button is used to add data in one portion of the application, then it should be used throughout. In addition, this means that certain

interactions, such as our “swipe down to view” feature, should be re-thought, because they clash with already existing IOS features.

The application was inconsistent in its design and interactions. Our team believed that fixing this problem would consist of a series of small tweaks to interactions on every screen. For example, we would be sure to place buttons that “add” content on the same place in every page in which they appear. We would also eliminate any strange interactions, such as the swipe-to close page feature, and incorporate commonly used navigation features such as a back-button. This insight represented less of a specific fix, and offered more of a philosophy to use when re-designing each page.

We implemented these principles throughout our build process.

Final App

Our team was successfully able to design and release a stable, testable version of the Momento Application. Incorporating a large portion of our user feedback, the final version of the app was simplistic, streamlined, and intuitive in its functionality. Momento was built using React Native and JavaScript on the front end, and Firebase as the backend data storage system. We received some iterative feedback on the hi-fi version of the application before release, and made a series of tiny tweaks; we added a navigation bar at the top to enable users to easily change pages, and also added an “edit” screen to the “view moment” page (See Figure 6).

Our team was excited and proud of the application that we had created, and it’s core features were as such:

Post important shared experiences (moments)

- Post photos for experiences
- Post descriptions
- Post feelings and thoughts

View past moments

- View past memories
- Edit memories

Interact with your network

- Invite any individual to your timeline
- Receipt and respond to prompts encouraging you to express gratitude

Our team released IOS and Android versions of the application for a field study on May 22, 2018, by utilizing Apple TestFlight and Expo for launch.

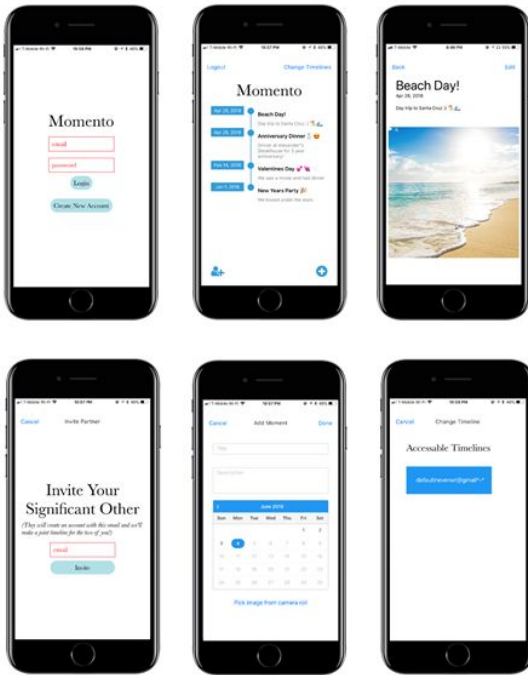


Figure 6. Momento Application

FIELD STUDY

Test Overview

We tested Momento with 7 couples and 2 additional solo users. Of the 16 total users, 14 used the iOS version of the app and 2 used the Android version for a period of 10 days. Users were recruited through our combined networks. All were tech-savvy young professionals in heterosexual, monogamous relationships between the ages of 22 and 32. While our users did lack racial diversity, they did span our target demographic, which was young adults age 18-35 who use technology often.

Methods

Of the 7 users who were fairly active over the field study period, we interviewed 5 users, including two couples. We combined this qualitative approach with content analysis on the types of material users were posting and quantitative analysis of user data.

Instrumentation

We instrumented our app with Google Analytics and recorded every time a user navigated to a particular screen or executed a particular event. The key events we analyzed were split into four categories: Log-in, Account, Moment, and Image.

- Login contained both Logging in and Logging out.
- Account contained Creating an Account.
- Moment contained Creating, Editing, and Deleting a moment

- Image contained Adding an Image to a moment

QUANTITATIVE ANALYSIS

Overall System Usage

Daily active users stayed impressively stable across the entire field study. Users averaged about 4 sessions across the entire test, but deviation was high with some users only opening the app once and others using it almost every day. The average session duration was over 4 minutes, which is extremely long. This is likely because users had to login every time they started a new session and also because, towards the end of the test, users began viewing moments more (uptick at the end of the 'Avg Session Duration' graph). (See Figure 7)

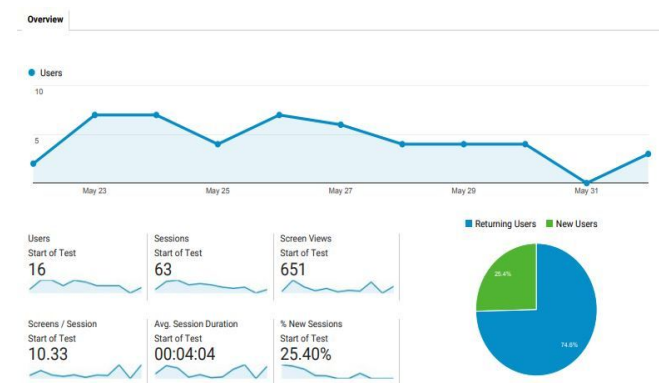


Figure 7. Overall System Usage

Overall Events

Users completed disproportionately high numbers of actions towards the first two days as compared to the rest of the study. This is likely driven by the fairly hefty process that users had to go through to create an account, login, and invite their partner. Even so, user events dropped off rapidly a few days into the test, then stayed steady. From May 25 through to the end of the test, users collectively completed ~12 events per day.

The “Login” and “Account” events (create account, login, logout) accounted for 66% of all events, which is far too high. This is almost certainly driven by users having to login every time they began a new session and the fairly difficult account creation and timeline pairing flow. This data clearly indicates that there are two immediately important fixes to make. The first is to improve onboarding by making it easier, faster, and less frustrating. The second is to keep users logged in between sessions. (See Figure 8)



Figure 8. Overall Events

Moment Generation (Create, Edit, Delete)

Users added 42 moments across the entire field test, averaging 2.6 moments per user with fairly high variation - this is largely driven by a few power users. Users created far more moments towards the beginning of the study, but the drop off a few days into the study was not as drastic as the drop off in total events (driven by users no longer creating accounts and pairing timelines).

The conversion rate for the add moment funnel was 54% (users began the flow 78 times and created 42 total events). This seems reasonably high! Moment editing was fairly rare, accounting for 17% of total Momento events and the delete function was completely unused across all users. (See Figure 9)

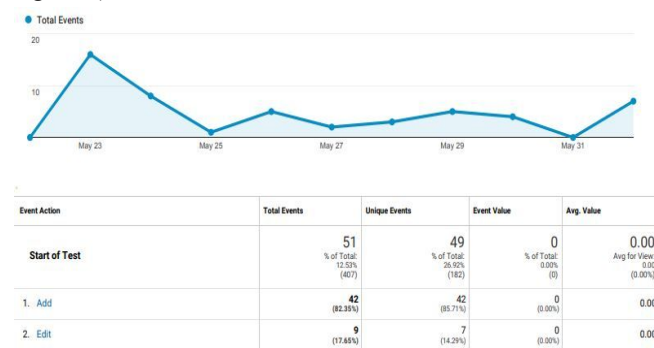


Figure 9. Moment Generation

Moment Viewing

On average, each user viewed 5.4 moments across the study. Users viewed moments frequently at the beginning and at the end of the study. The density at the beginning is likely driven by users simply exploring the app. The density at the end seems to indicate that once users had a critical mass of moments on their timeline, their behavior started turning towards using the app to remember and appreciate moments as opposed to using the app solely to log events. It

is difficult to tell given the small sample size, but our qualitative analysis supports this interpretation. (See Figure 10)

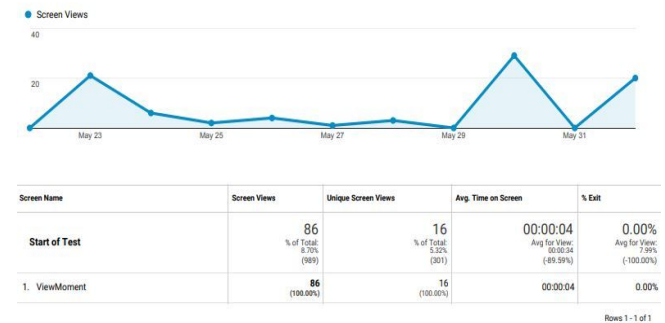


Figure 10. Moment Viewing

Screen Behavior Flow

When users started using the app it was usually to add a single moment. The most common session flow was Login → Home → Add Moment → Home (End Session). Users dropped off a lot on being prompted to Login - which gave us more evidence that users should stay logged in across sessions.

A majority of screens surrounded logging in, creating an account, and pairing timelines. While this is likely driven by a fairly short testing period, it is also evidence of a cumbersome onboarding process. (See Figure 11)



Figure 11. Screen Behavior Flow - Flow across 5 screens

Retention

One-day retention stayed fairly strong through the fifth day of the test, but dropped noticeably on day 6 and day 7, and finally fell to near zero on days 8 through 11. On a high-level, this seems to indicate that users had declining interest in the app over the course of the test.

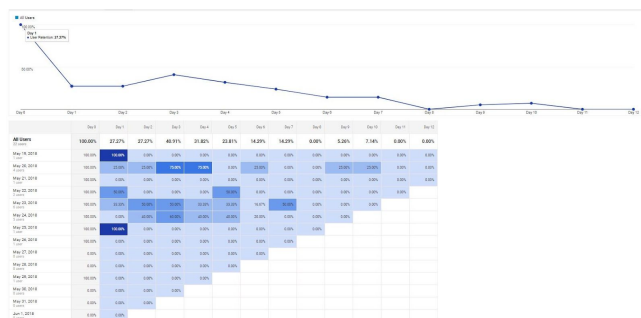


Figure 12. Retention.

Quantitative Insights Summary

In terms of positive insights, we found that users generally found a lot of value in adding moments to Momento, as we had a pretty high number of users add a lot of moments over the test. Users found viewing moments interesting, but tended to do so much more when their timelines were composed of moments added a while ago (i.e. there is no use in viewing moments you just posted, they're valuable later). In terms of negative insights, onboarding and timeline selection was clearly a painful and cumbersome process. Additionally, forcing users to login every time they began a new session added a lot of weight to using Momento and almost certainly drove use down.

QUALITATIVE ANALYSIS AND IMPLICATIONS

User Interviews

After distributing our application, we engaged user sentiment by conducting a qualitative study of our participants. We selected five participants, and conducted follow-up interviews with them. Pseudonyms have been assigned to each of them to protect their identities. Interviews with five users revealed surprisingly positive experiences with Momento. Despite several clear (and very fixable) user experience blunders, our application generally had a positive effect on interviewees' relationships, encouraging them to reflect on their partners and practice feeling and expressing gratitude. Most users that we interviewed thoroughly enjoyed Momento and saw real value it added to their lives. User reception was not universally positive, though; there were insightful criticisms that yielded numerous design implications.

Theme 1: Momento is a good excuse to practice gratitude and appreciate my partner

Most of the heavy users expressed that they really liked or even "loved" having consistent prompting to feel grateful and to reflect on their partner in an appreciative way. Carla said it well when she expressed, "I like the idea of practicing gratitude in all aspects of life. It's nice to have an excuse to think about my relationship with Andrew." Even though she is an expressive person, Carla recognized that in her daily life, she rarely stops to think about what she most loves about her boyfriend. Andrew, despite his lack of active posting on the application, recognized the same

value. He mentioned, "It was nice to appreciate those kinds of things about each other that we never have a trigger to think about." In a similar way, Mike explained that he genuinely enjoyed the reflection on each individual day: "I'm more grateful for the time I get to spend with her. I think about the things we do more critically because I see what we do every day."

Design Implication

Even though users were quick to laud this aspect of the app, and it was typically what they valued most about it, they expressed some confusion about whether this was truly meant to be the purpose of the application. After first signing up, most users' first engagement with the app was adding memories from their past, which initially seemed to be the core function of Momento. The addition of daily prompts encouraging gratitude and reflection for one's partner seemed different. Carla noted, "I'm really curious about the purpose [of] the app. As I'm using it, I'm wondering if it's to keep a timeline of a relationship for memory-keeping or to promote open conversations or both?" Given how much users valued the daily reflection opportunities, this should be front and center when they enter the app. Carla loved the idea of adding a splash page with "Momento" at the top of the screen and below it, two lines about the purpose of the app: "document memories" and "practice gratitude daily."

Theme 2: Revisiting a relationship's history was a powerful reminder of the good

Mike remarked, "It's good to see that my life hasn't been boring for the past month." Our team was excited to hear that people viewed the timeline as a living collection of happy memories to be revisited. Andrew felt similarly, expressing, "In addition to the daily prompts, I thought it was really cool that we could go back and look at our history." Despite his lack of posting moments, he did visit the site several times just to look at all of the nice things Carla had been posting, enjoying the history of happy moments she had worked hard to build. And Carla, unsurprisingly, did feel a bit of fatigue with her consistent, unreciprocated adding of moments. She likened her posting to the act of putting together an album: "It can be hard to appreciate photo albums while you're making them, but then it's great when you get to watch them."

Design Implication

One user made the suggestion that we reward users hard work by giving them reminders of the happy times they had compiled. While users can always travel through their past by clicking through moments, we recognize real potential in putting together slideshows of happy moments to automatically play for users, potentially serving as "Highlights of the past week or few weeks." We agree that would be a great, labor-free way to give users access to their histories and reward their consistent posting.

Additionally, to make viewing one's history easier, one user also suggested a feature whereby one could see a preview of the picture associated with moments before entering the moment page. This would allow people to more easily scan their past for the specific moment they might be looking for. Currently, each moment is represented with an identical dot. The more moments one has posted, the more arduous it would be to find an old memory.

Theme 3: Unequal posting produces frustration for the active poster

When creating Momento, we did not anticipate just how uneven couples could be in their engagement with the application. For both couples that we interviewed, the woman was an active, almost daily poster of moments while the man acted as more of a lurker on the shared timeline. Carla was not explicit in her disappointment, but her tone and comments suggested frustration. She recalled, "The one time [he] used it, I thought, 'I wonder why [he] chose that photo,' but I also thought, that's nice that he's contributing and I'm not the only one doing it." She also mentioned, "He apologized to me about not posting more." Picturing a more realistic use case, she added, "If we agreed to do this because it was something for our relationship, I would have been annoyed." Similarly, throughout her interview, Trisha expressed dismay that Mike, her partner, posted fewer reflections than her. Rebecca also explained that her partner never posted, and she forgot to remind him to do so. Interestingly enough, Mike and Adam, the partners of Trisha and Carla, loved having nice things said and appreciated about them, but posted mainly about events themselves, and not reflections on their partners. Although our sample size is limited, we worry that perhaps there is a gender dynamic where women are more expressive and men get to sit back and feel appreciated.

Design Implication

Our team is very concerned that unequal posting could accomplish the opposite impact to our intended one, creating tension between partners. As such, we believe that finding ways to motivate the lesser-posting partner will be critical to Momento's success. One idea is to give the lesser-poster updates on how much their partner has been posting. By framing the situation positively and not in a shaming manner, perhaps the lesser-poster would feel motivated to post more moments and respond to more reflection prompts. An alternative strategy proposed by another field study participant was to inform users when their partner posted a reflection about them, but restrict viewing access on their phones until they responded to their own prompt. This type of challenge is ideal for an A/B test. One group of users could be given a updates on how much their partner has been posting, e.g., "Carla is on fire! She's posted 5 days in a row!" Another group could experience restricted access until both partners posted.

Theme 4: The recipients of generous posts feel like a million bucks

While the frequent poster felt occasional frustration, the recipient of those posts felt loved and valued. Andrew beamed, "Reading her responses made me super happy." He was surprised by how "super sweet and sometimes unexpected" her reflections were. He attributed much of their positivity and potency to the quality of the question prompts, remarking, "I thought the questions were really nice... I loved her answers." His most recent time entering the app, he wasn't expecting to see any new content and stumbled upon a post that he found "really fun and flattering." When asked to recall how the app affected his relationship, Andrew recalled a memory. He said that Carla was supposed to cook dinner one night then got held up at work so he made food for the both of them. When he saw, the next day, how much Carla had appreciated that action of his, he was touched by how much it meant to her. He expressed wanting to cook for her more as a result. Mike also frequently logged into the app to see what Trisha had said. He explained that he would do this in his free time, supplanting his use of traditional social media. He stated, "On social media, it dissolves into nothing, but this is tangible and worthwhile."

Design Implication

We should allow users to interact more with the posts of their partners. Currently, they have the ability to edit, but a more appropriate response might be the option to reply or love a moment. One concern is that "loving" each moment may reduce the meaning of the heart symbol. To minimize response burden, perhaps allowing a person to give one word (or one adjective) to describe their reaction could convey how touched someone is. In addition, some users expressed a desire to immediately know when they had been posted about - sending a simple push notification when a new post is made could solve this issue.

Theme 5: Logging in was the biggest barrier to engagement

Every interviewed user expressed frustration about having to log into the app each time they used it. Andrew fumed that it was a "huge hassle to open the app and login every time." He continued, "When it was like 10:30, the log in friction was just too much." To add to his woes, he chose a long and complicated password, which he said was a major deterrent to his entering the application. Andrew was not alone with this sentiment. Carla commented, "Having to sign in each time I wanted to use it stopped me from updating more often." Mike similarly expressed dismay in having to log into the application every time he needed to use it, exclaiming, "The login experience was pretty awful. Eventually, it got sorted out, but dang." He frequently ignored push notifications, because he would need to log-in to respond to them. Rebecca also believed that the log-in

process was difficult, and skipped push notifications as well.

Design Implication

Users should remain logged in on their devices

Theme 6: Users need to see the timeline as shared with one partner

Interviewees expressed that it was critical for their timelines to look and feel shared with their partners. They needed to know that their partners would definitely see everything they posted, commenting further that this was the major differentiator between Memento and Facebook. Trisha, specifically, disliked the application for this reason. She claimed, “I couldn’t tell the difference between this and Facebook Walls. There’s no togetherness in the app, since we each had two timelines [their timeline, and their partner’s timeline].” Andrew, similarly, expressed the importance of labeling timelines with both partners’ names or faces. He said that even though he knew, “intellectually,” that his timeline was shared, it just didn’t feel shared. He admitted that it was a bit “irrational”, but he genuinely worried that his posts would not be seen by Carla and that dissuaded him from posting more.

Design Implication

We should put both names or faces at the top of each timeline. Additionally, we should delete the feature whereby users can create private, non-shared timelines.

Content Analysis

Our team conducted a content analysis of our users’ posts in the Memento application. Our goal was to identify the kinds of content users produce to 1) observe the effectiveness of our application in its ability to promote positive, meaningful reflection, and 2) see what types of content users are posting, including any unexpected uses that lend design insights for app improvement.

We looked at every post our users created and were able to divide them into a series of categories. We categorized 42 posts out of the 49 total posts, which included 5 trolling posts from one user intended for the design team and 2 uninterpretable posts. The full list of content analysis categories is shown in Table 1.



Figure 13. Affinity Grouping

Table 1: Content Analysis Categories

Type & Amount	Definition of Category	Example
<i>Lolz</i> 12% (5)	Recollections of humorous exchanges, jokes, memes, and funny experiences	"All her jokes about sexy rain pants and toteros on the phone last night"
<i>Affection</i> 7% (3)	Expressions of desire or appreciation for the physical touch of a partner	"I appreciate... when my honey bears snuggles with me"
<i>Trips and Adventures</i> 10% (4)	Documentation of adventures and/or trips that couples embarked on together	"Went to the beach!"
<i>Simple Date Nights</i> 7% (3)	Documenting hangouts, get-togethers, and dates	"Late night dumplings!"
<i>Acts of Service</i> 7% (3)	Expressions of gratitude toward a partner for a kind act	"...he cooked dinner for me because I was running late and even though I had said I'd be over by 7:45 he knew me well enough to plan for my arrival at 8... made me laugh when he told me."

<i>What I value about our relationship</i> 5% (2)	Expressions of gratitude for qualities of the relationship that one partner really values.	"I really appreciated when my SO took the time to really listen to and support me when i was feeling down."
<i>Qualities I value in my partner</i> 12% (5)	Direct praise of a partner's qualities	"You have the most amazing smile that lights up my world, that's why i tell all the jokes."
<i>My partner loves family</i> 7% (3)	Expressions of gratitude for the degree to which one's partner loves or cares about their family.	"I love that My girlfriend cares deeply about her family because it shows how loyal of a person she is."
<i>Firsts/ Previous Events</i> 31% (13)	Documentation of milestone events that occurred before the app was downloaded.	"...our first ever weekend trip together... I missed an exit (as usual) and we ended up in some creepy nowhere town deep in the valley, that had an abundance of graveyards... I just remember cracking up the whole car ride."

IMPLICATIONS

From our initial interest in fostering constructive conversation to exploring conflict resolution to ultimately producing a memory documentation app that drives gratitude between couples, we've learned a lot about our general domain as well as how Memento can further achieve its goals within said domain.

Namely, we identified a few main concepts that we would implement going forward:

1. Improve onboarding flow by providing more guidance and feedback in helping users create their account and connect with their significant other's account. Given that our onboarding flow involves a non-standard process of producing a private timeline shared between a couple, paying more attention to how users get on their feet would payoff immensely.
2. Keep users logged in between sessions

3. Add more ways for users to interact with different moments. Currently, users can only edit the original details of moments.
 - a. Allow users to "love" moments to mark them as particularly special.
 - b. Allow users to post comments on moments, enabling users to have discussions around specific moments
4. Enable users to search for moments by date, title, and location
5. Once users have a critical mass of moments on their timeline, compile weekly or monthly highlights/slide reels consisting of existing moments that get sent to users. This feature would expand on appreciation, one of Memento's core use cases

Our domain is all about facilitating meaningful connections between couples by fostering appreciation and gratitude. Through our work, we learned a number of insights relevant to other applications in our domain.

1. Partners have very nuanced and often highly variable dynamics, seemingly much more so than individuals do. As a result, usage of an app for couples will vary a lot between user groups. It is important to focus on the different ways couples use the app and on how edge cases are affecting usage. Furthermore, clear design and communication of how couples are supposed to share the space is extremely important.
2. In couple-based apps, one partner may be more invested in the app than the other. This often leads to unequal levels of use that affects the dynamics between the partners. Encouraging equal use of the app or at the least helping set expectations between partners is instrumental.

REFERENCES

1. Heyward, Michael. [Whisper](#).
2. Serroni, Dean. [Vent](#).
3. Mojabi, Pouria. [Paralign](#).
4. Sonja Lyubomirsky. 2007. *The How of Happiness: A Scientific Approach to Getting the Life You Want*. Penguin Books.
5. Harvard Health Publishing. The secret to happiness? Here's some advice from the longest-running study on happiness. 2017. Retrieved June 5, 2018 from <https://www.health.harvard.edu/blog/the-secret-to-happiness-heres-some-advice-from-the-longest-running-study-on-happiness-2017100512543>