Recalibrating the Ratio: Enacting Accountability in Intimate Relationships Using Shared Calendars

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ABSTRACT
This study enriches the understanding of relationship work in the context of calendar sharing by examining how people negotiate and enact accountability in their intimate relationships with and around their shared calendars. We conducted 13 semi-structured interviews as part of a qualitative study of Google Calendar users. Our research discovered how participants develop understandings of how close friends and significant others structure their time using shared calendars, as well as how people negotiate and enact accounts within and beyond their intimate relationships. Our findings indicate ways in which Online Calendar Systems (OCS) can be better designed to more effectively support users' needs.

Author Keywords
Accountability; calendars; intimacy; qualitative research; relationship work.

ACM Classification Keywords
H.5.3 [**Information Interfaces and Presentation (e.g., HCI)**]: Group and Organization Interfaces.

INTRODUCTION
Over the past several years, online calendaring systems (OCS) have become an increasingly popular alternative to paper calendars [20]. Early work on OCS investigates their coordinative use in the context of corporations or large organizations [4, 10, 11, 17, 18, 19, 20, 27], while more recent studies describe calendaring practices in the context of family activity [9, 14, 15] and among young adults without children [26].

As [2, 14, 25] point out, people who share calendars continue to have face-to-face, coordinative discussions about their activities and their rationale for planning and scheduling those activities. Such coordinative activities are one aspect of *relationship work*, or the set of negotiated practices that foster, maintain, and sometimes damage friendships and feelings of intimacy. Prior work [26] determined that people in intimate relationships perform relationship work when they share calendars, resulting in different calendaring behaviors compared to familial and organizational OCS users.

The present study expands upon prior work by applying the concept of accountability as a lens for exploring the performance of relationship work with shared calendars. Feelings of intimacy are grounded in bonds of trust, which are forged when people act accountably toward one another. This study deepens our understanding of calendar sharing as relationship work by examining how our study participants negotiate accountability with and around their shared calendars, as well as attempt to act accountably from the perspective of their close friends and significant others. We explore the accounts that our participants read, interpret, and describe in their shared calendars in order to identify opportunities for the design of calendaring systems that will better support relationship work.

We therefore study OCS use by addressing the following research question in the context of the enactment of accountability: *How do OCS users perform relationship work with and through their calendars?* To answer this research question, we interviewed 13 users of Google Calendar, a popular OCS that has been freely available since 2006 and that has millions of users. The novel contributions of this paper are to describe the relationship work practices in which participants engage in the service of acting accountably, as well as discuss potential OCS interface and interaction design interventions inspired by those practices. Such interventions could help OCS users maintain their intimate relationships by more effectively supporting their performance of accountable behavior.

In the sections that follow, we first discuss the literature that is related to the topic of this study, with a focus on defining intimacy, trust, and accountability as they relate to our research. We then describe our study design and methods, followed by a detailed explanation of our findings as they relate to our research question. We conclude with a discussion of the study results and the implications for design that the results suggest.

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RELATED LITERATURE

In this section, we first discuss the concept of intimacy and the different types of interpersonal relationships in which people can participate. We then describe the concept of trust, as well as how people develop intimacy and bonds of trust in their relationships. We conclude by situating intimacy and trust in the context of accountability, which we define in terms of being answerable and explainable for one's actions.

Defining Intimacy

Of the six types of interpersonal relationships [30], two can be considered intimate relationships: *reciprocal friendships* (e.g., two people who choose to be friends and who demonstrate a mutual commitment to their friendship) and *romantic relationships* (e.g., two people who are married). Hereafter, we refer to individuals in intimate relationships as close friends and significant others.

Additional relationship types include associative friendships and kin relationships. In an associative friendship, two people are friendly with one another due to a shared commitment, such as a job, and are not interested in developing intimate relationships. In a kin relationship (including relatives and direct family members), two people can decide whether they want a reciprocal friendship, or they can decide not to be friendly at all. Their genealogical connection persists regardless of how they choose to act toward one another.

At its core, intimacy can be defined as the shared knowledge that unites two people. This knowledge not only shapes current experiences but also "informs and deepens subsequent interactions between…partners" [23]. There is not necessarily a moment in every intimate relationship when both partners explicitly declare to one another that they are "close" friends. Instead, this sentiment is felt through ongoing engagement in intimate interactions.

There are three criteria for intimate interactions: "self-revealing behavior, positive involvement with the other [individual], and shared understandings" [23]. These criteria are defined as follows:

- Self-revealing behavior occurs when two people disclose aspects of themselves that are emotionally challenging to discuss or that make them psychologically vulnerable.
- Positive involvement between two people entails both individuals making it clear that they are engaged with the conversation, and is often expressed through a person's choice of words, cues drawn from body language, and so on.
- Shared understandings among partners in intimate relationships involve mutual familiarity, which develops as two partners bond through conversation and shared experiences over time.

When two partners in a relationship engage in these types of interactions, they generate *interactional intimacy* with one another. Interactional intimacy can occur in non-verbal ways [23], whether the intimate behaviors take place in person or are technologically mediated, as with a shared calendar. Interactional intimacy is also predicated on feelings of trust between two partners in an intimate relationship. In the next section we explore what it means for two people to trust one another, leading to a discussion about accountable behavior as the foundation for both intimacy and trust in an intimate relationship.

Defining Trust

The concept of trust is defined in a number of different ways depending on the theoretical perspective of the scholars who discuss it. We follow the definition that McKnight, Cummings, and Chervany [13] provide as a result of their exhaustive, interdisciplinary research into other scholars' discussions of trust.

According to [13], feelings of trust are based on beliefs and intentions. Trusting beliefs are comprised of four attributes: benevolence, competence, honesty, and predictability. [13] claim that when two people believe these attributes are sufficiently present in their relationship, they are able to establish trusting intentions whereby they decide to depend on one another. Therefore, these four trusting beliefs positively inform the decision that people make when they become willing to trust one another.

As with intimacy, feelings of trust are sustained over time as two partners continue to meet the social expectations they have established for their relationship together. In healthy intimate relationships a bond or cycle of trust develops when one partner believes the other is routinely trying to act in the best interests of the relationship. In the context of OCS use, this bond of trust is strengthened when people perform the activities they say they will perform, as indicated by the events on their shared calendars.

Feelings of trust and mistrust alike can develop as close friends or significant others decide how to balance their pursuit of individual interests with the potentially conflicting interests of their partners [24]. Specifically, mistrust can develop when one partner perceives the other to be acting in a way that is harmful to their relationship, especially if those actions appear to form a pattern over time. When trusting beliefs are negatively influenced, trusting intentions are also impacted and one partner can cease to depend on the other in given situations [13].

The definitions of intimacy and trust provided here tell part of the story about how people form and maintain their intimate relationships. As stated earlier both of these concepts are based on a more fundamental behavioral process: acting accountably toward other people. In the next section we define the concept of accountability in the context of OCS users' behavior with and around their shared calendars.

Defining Accountability and Acting Accountably with and around OCS

Prior work has explored the calendar work and life scheduling behavior of OCS users [cf. 9, 14, 15, 18, 19], as well as the relationship work of young adults in intimate relationships [26]. At a conceptual level, the performance of accountability is the foundation of coordinative behavior among partners in intimate relationships because accountability undergirds both intimacy and trust. Tracing the enactment of accountable behavior through OCS use reflects an underexplored approach to understanding the relationship work that people perform. The present study is designed to enable a richer level of analysis of the ways in which intimacy and trust play out among partners in intimate relationships by framing those phenomena in the context of enacting accountability.

Garfinkel [8] defines accountability as the organization of rational and reportable behavior enacted as an ongoing process. Similarly, Eriksén defines accountability as the ongoing process of the production and management of organized, everyday affairs [6]. Additionally, relationship work is performed in the spirit of what Troshynski, Lee, and Dourish [27] describe as socially accountable behavior.

Accountability, then, is a state of being that is continuously enacted among people in various ways. However, Garfinkel and Eriksén both acknowledge that the notion of accountability is actually comprised of two different elements. Eriksén [6] summarizes these elements using the words "answerable" and "explainable." We will use these same words to reference the two elements of accountability throughout the rest of this paper.

Being answerable is an attribute of OCS users' behavior whereby they let others know when they will be available to spend time together. The collection of events within a shared calendar provides visibility into the world of the person who owns that calendar. Close friends and significant others understand this fact, and use their calendars in a self-revealing way: They indicate when they are free and when they are busy. OCS users begin sharing calendars in order to enhance the amount of visibility they have into the lives of close friends and significant others so they can find time to hang out [26].

Whereas being answerable is about indicating whether specific times are free or busy, being explainable is about telling others what one is doing during the busy times. OCS users make themselves explainable through the titles and descriptions they write for their events, and they rely on the event descriptions of others as explanations of their behavior. Being explainable is a continuously negotiated state of being that describes how calendar owners report their activities to other people. Close friends and significant others expend a great deal of effort explaining to one another how they are spending, or are planning to spend, their time together [26].

Acting accountably, then, is comprised of being answerable and explainable for one's past, present, and future behavior. Given that OCS are collections of members' accounts [8] of how they will spend their time, as well as how they have spent their time, the act of sharing calendars makes both partners in an intimate relationship members of those calendars. As members, they agree to rely on their shared calendars as expressions of their accountable behavior.

This tacit agreement occurs even as partners struggle to understand **how** they can use shared calendars to know whether they are both acting accountably. Importantly, bonds of trust and feelings of intimacy can be damaged by inaccurate perceptions of other people's behaviors and intentions. For this reason, the practice of shared calendaring necessitates some amount of offline, coordinative discussion to clarify any discrepancies between the description and the intent of a calendar entry, or the description of an event and the resulting behavior of the calendar owner. They do not plan to have these discussions, but they become necessary when they must confirm their true intentions and clarify their behavior in the context of their calendars. In so doing, they are attempting to preserve their feelings of intimacy and bonds of trust, both of which are predicated on the perception of mutual accountability.

Summary

There are three main takeaways to draw from this section. First, trust is a prerequisite for the development and maintenance of interactional intimacy, which can be developed through non-verbal communication, as when people rely on OCS to help them arrange their social lives with others.

Second, accountability is critically important to the health of every intimate relationship. However, acting accountably requires being answerable and being explainable for one's activities. Both forms of accountability play out within and around OCS when close friends and significant others use shared calendars with one another.

Finally, given that partners' feelings of intimacy and trust are at risk when their accountability is called into question, we feel it makes sense to situate this study in the context of close friends and significant others attempting to act accountably with one another. In so doing, we enable ourselves to follow the practices on which partners in intimate relationships rely to successfully enact accountability with and through their shared calendars.

In the remainder of this paper we first outline how we designed our study to understand how OCS users enact accountability in their intimate relationships with and through their shared calendars. We then describe the subtle ways in which our participants enact accountability using their shared calendars. We conclude by discussing the combination of participants' negotiation and enactment of accountability in their intimate relationships using OCS.

STUDY DESCRIPTION

Although we know from prior research that OCS users perform relationship work with and through their calendars [26], it is unclear how OCS can be designed to more effectively support the negotiation of accountable behavior among close friends and significant others. Further, both forms of accountability (being answerable and being explainable) are often enmeshed and are challenging to separate when discussing specific cases of calendar sharing and use. The fact that these elements of accountability are so tightly woven indicates the difficulty of the design challenge at hand: effectively supporting the maintenance of intimate relationships through OCS interface and interaction design.

We developed the present study of Google Calendar use among close friends and significant others to help meet this challenge. In this section we provide an overview of our participants, describe the specific OCS application we studied, and explain the methods we used to gather and analyze our data.

OCS Application

We selected Google Calendar as the OCS for this study because it is a freely-available, widely-used OCS. Users of Google Calendar create "events," which can be titled, given a location and duration, and can include additional information ("notes").

Additionally, Google Calendar users can create and manage multiple calendars; each calendar has its own level of privacy and can be shared individually with any number of other individuals. When users view multiple calendars, they can choose from a palette of colors how to distinguish each calendar's events from all other events (refer to the screenshot in Figure 1, below). Event creators can "invite" other individuals to a specific event, making the details of that event visible, or they can "share" the contents of a calendar with another individual.

There are four possible levels of access (refer to the screenshot in Figure 2 on the next page):

- "Free/busy" is the most basic level of sharing, as it shows the date, time, and duration of calendar events but no event titles or additional information,
- "See all" lets others see the details of any event on a calendar that is shared with them,
- "Make changes to events" grants complete control to all details of any event, regardless of who created it,
- "Make changes AND manage sharing" allows for full control of the calendar and the sharing preferences.

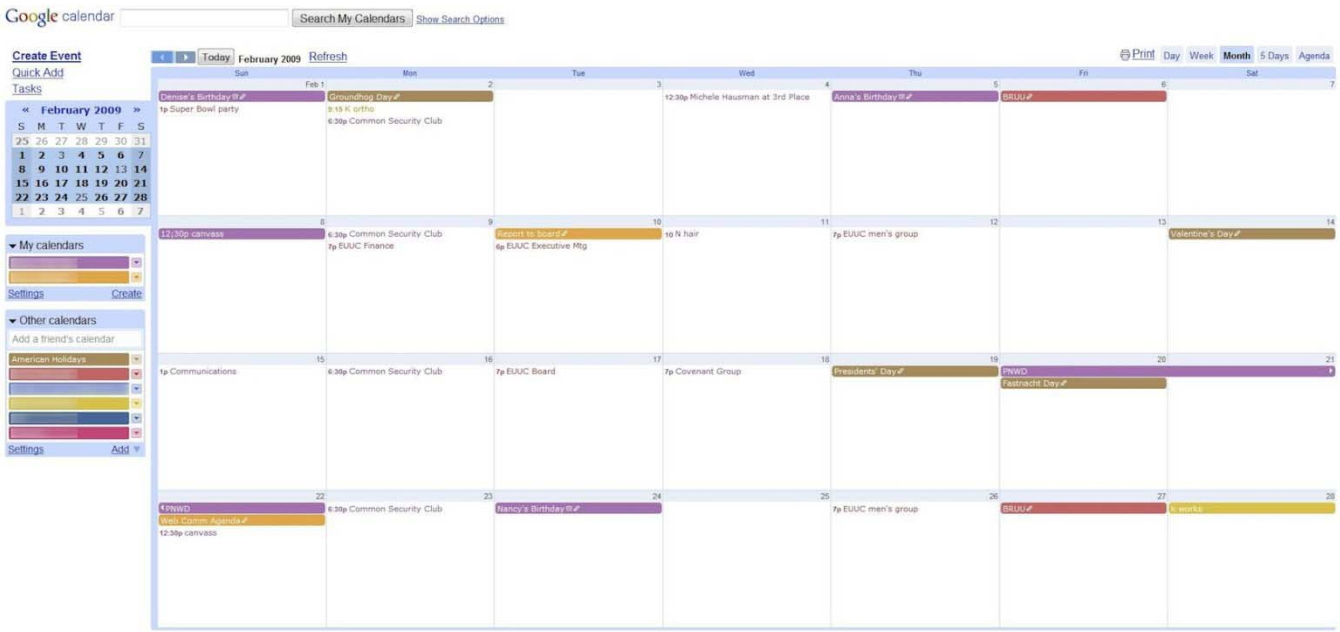

Figure 1: A screenshot of Google Calendar, featuring two calendars that the user owns and six calendars shared with that user.

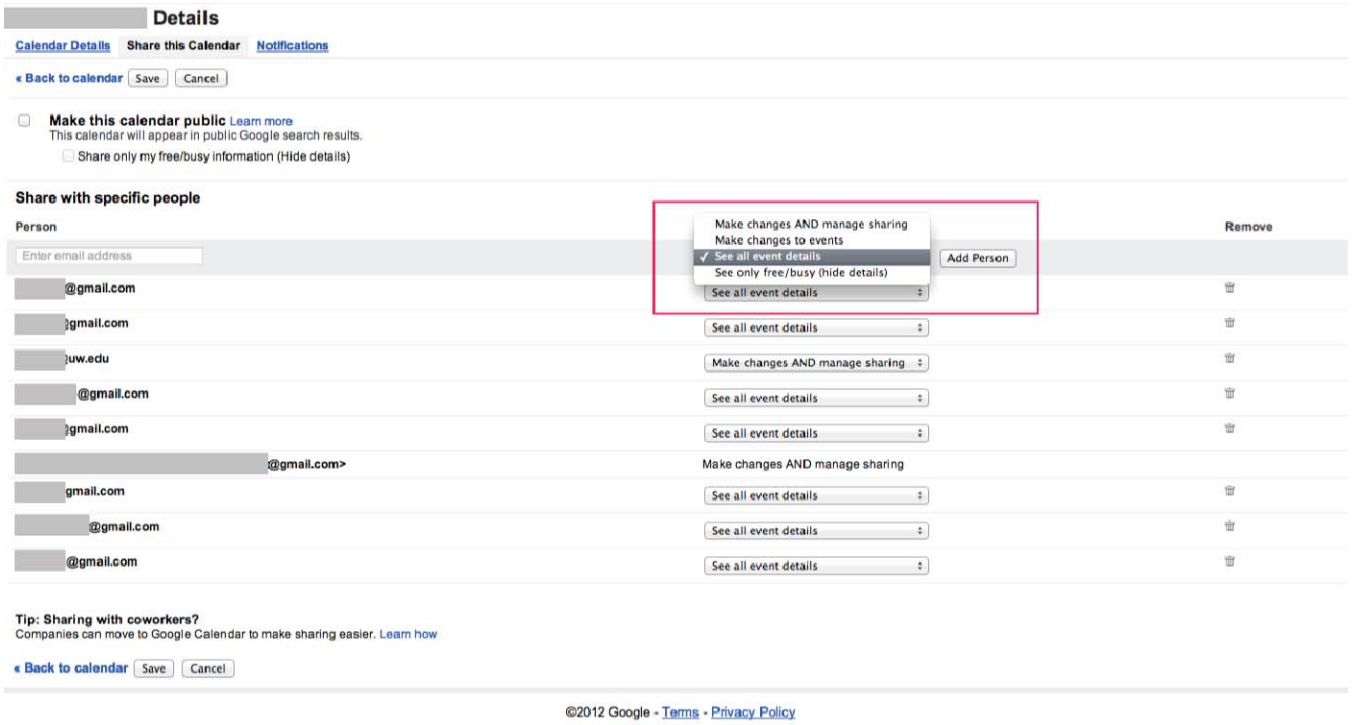

Figure 2: A screenshot of the sharing preferences for a specific calendar. The red box indicates the four sharing options that are possible for any given individual.

Participants

Our study took place from February to April 2011, during which time we conducted semi-structured interviews with 13 participants (6 women and 7 men), who had an average age of 27. Our participants included 6 students, 6 individuals with full-time jobs, and 1 individual who was unemployed.

Participants were solicited through email mailing lists associated with our university as well as through announcements of the study via personal social networks. The criteria for consideration as a participant included using Google Calendar, sharing a calendar with at least one other person, accessing at least one other shared calendar, and being older than 18 years of age. Participants were not compensated for their time.

Limitations and Differences from Prior Work

We acknowledge that Google Calendar is but one among several OCS that are available as of 2012. However, our prior work on OCS involved Google Calendar [26], and because the present study is an expansion of that prior work we chose to retain the same OCS.

Our previous work also informed our present study design as we chose to recruit a specific type of Google Calendar users for this study. We focused on interviewing individuals in their twenties and thirties who used OCS primarily with their close friends and significant others, and who did not have children around whom they would need to coordinate their lives. Additional studies of other types of participants (e.g., organizational users) could yield more types of activities and strategies to support relationship work. Further, we relied on an existing typology of interpersonal relationships as our goal was not to generate our own typology. Future research into shared calendar use could fruitfully probe the boundaries, expectations, and definitions of shared calendar users' relationships.

For the present study we wanted to dive deeper into the lives of partners in intimate relationships in order to understand more thoroughly how the enactment of accountability can be supported with and through OCS. Prior work [26] described some of the techniques that close friends and significant others use when negotiating shared activities using OCS. The present study expands upon that work by applying the concept of accountability as a lens for exploring the performance of relationship work with shared calendars.

Specifically, in this study with a new set of participants, we distinguish between being answerable and being explainable as facets of accountability. Additionally, because bonds of trust and feelings of intimacy are predicated on acting accountably with close friends and

significant others, this richer definition of accountability enables us to describe and analyze accountability practices and behaviors with more precision than in our prior work..

This subtle difference is important because, as stated earlier, feelings of intimacy and trust stem from acting accountably. By situating accountability at the core of this paper, our intent is to develop an understanding of the underlying phenomena that motivate partners in intimate relationships to use OCS as they do. Acting accountably means thinking ahead about how calendar entries will be interpreted, as well as looking back to decide how specific entries were interpreted. Therefore, forward-looking and retrospective uses of OCS abound when partners in intimate relationships rely on their shared calendars to determine whether each partner is acting accountably, an observation that follows Lynch's [12] description of how people's embodied practices result in accountability (p. 33).

Finally, our study is qualitative by design, which is a particularly powerful way to obtain descriptive, empirical data that reflect real-world OCS use. In the next section we describe our qualitative methods in more detail before turning to a discussion of our findings.

Methods

Each participant was interviewed once in person using a standard semi-structured interview protocol. At the start of each interview session, the researcher filled out a survey with the participant that gathered data about the participant's relationship status (e.g., single, married, in a relationship but not living together), the identity of others with whom the participant had shared calendars (e.g., name, relationship to the participant, how long the sharing has been going on), and the identity of others whose calendars had been shared with the participant. The intent was to develop a clear view of each participant's social network as defined by his or her shared calendars.

The interview protocol included 6 questions about the relationships and calendaring practices of each person who accessed or shared a calendar with the participant (e.g., "How has sharing a calendar influenced your interactions with this person?"). The protocol also included 4 questions about general calendaring practices and relationship work (e.g., "Has your calendar use ever gotten you in trouble with someone?"). Interviewers were encouraged to ask follow-up questions and probe for greater detail and unexpected insights when possible. All interviews lasted between 21 and 51 minutes (mean: 38, median: 37, SD: 10.48); interviews were relatively brief when participants shared only one calendar and accessed only one other calendar. The interviews were recorded and transcribed, and all participant names were replaced with pseudonyms.

The research team initially coded the data using a standard codebook developed from the interview protocol. To ensure commonality of interpretation, all team members coded the same three interviews using the same codebook and discussed the results. Finally, after writing memos based on the initial codes, the team performed an open coding pass intended to identify examples of accountability, scheduling expectations and calibration activities, and accommodation of others' needs. In the following section, we describe the results of this analysis process in the context of how OCS users in intimate relationships perform accountability with, through, and around their shared calendars.

FINDINGS

We begin this section with an overview of the frequencies with which our participants share their calendars and access other people's calendars. Our 13 participants maintain and share 18 different calendars (mean: 1.36, median: 1, SD: 0.84), and access 32 different shared calendars (mean: 2.43, median: 2.0, SD: 2.31). All of the calendars have individual rather than group ownership, meaning that one person is ultimately responsible for their contents.

We observed a few particular sharing patterns across the 13 participants in this study. With regard to the calendars they owned and shared with others:

- 7 participants shared only with significant others (P1, P2, P3, P8, P9, P10, and P12)
- 4 participants shared with a mix of friends and family (P5, P7, P11, and P13)
- 2 participants shared with significant others and close friends (P4 and P6)

With regard to the calendars that participants accessed:

- 5 participants accessed only their significant others' calendars (P2, P3, P4, P8, and P12)
- 4 participants accessed a mix of significant others' and friends' calendars (P6, P7, P10, and P11)
- 3 participants accessed only their friends' calendars (P5, P9, and P13)
- 1 participant accessed a mix of significant others' and family members' calendars (P1)

As these data make clear, our participants share calendars with their close friends and significant others most frequently. Recall that the difference between a close friend and an associate is related to intimacy: Associates only disclose factual information to one another and are not interested in developing intimate relationships. Relatives and direct family members are distinct from close friends as well because of the bond of kinship that is present in these relationships. Intimate relationships are distinct from these other relationship types because close friends and significant others choose to be friends and demonstrate a mutual commitment to their relationship.

Given that our participants most frequently share and access calendars belonging to close friends and significant others, the goal of this section is to clarify the following facets of

the performance of accountability among OCS users in these intimate relationships:

- **Being answerable within an intimate relationship:** How partners in intimate relationships let one another know that they are trying to act responsibly.
- **Being explainable within an intimate relationship:** How partners in intimate relationships report their activities to one another.
- **Being accountable beyond intimate relationships:** How partners in intimate relationships negotiate both elements of accountability (being answerable and explainable) when sharing calendars with one another and with a variety of other people (e.g., coworkers, casual friends).

Being Answerable within an Intimate Relationship

In this section we discuss participants' strategies for becoming answerable to close friends and significant others with and through their shared calendars. Given that OCS are socially-constructed systems that describe how people plan to spend their time, the initial challenge of sharing calendars comes from creating a schedule of events that is not just readable for the calendar owner but that is also understandable to whomever else is looking at the same calendar.

The process of becoming answerable is a mutual process whereby calendar users take steps to make themselves answerable for representations of time (e.g. a calendar event), as well as for how they act in accordance with those representations. When close friends and significant others begin sharing calendars with one another, they go through a learning process whereby they attempt to understand how their partners manage and represent time. The differences in how they perceive time are expressed in a variety of ways: how and when they decide to schedule activities, the meaning of unscheduled time during which there are no events listed, and so on.

This learning process is made more challenging for partners in intimate relationships when a particular event is not listed on a shared calendar. For example, Bernadette described the difficulty she had in trying to locate her husband Nathan based on the events in his calendar, and alludes to the discussion that resulted when she addressed this situation with him:

I was trying to get a hold of [my husband] to go home and I wanted to go home. I get cranky when I get hungry and tired. {Laughs} And I couldn't get a hold of him. And then, you know, a half hour later, an hour later, whenever his meeting was over, he called me and said, 'Well I had a meeting.' And I said, 'Well it wasn't on the calendar!'

This example demonstrates the importance that Bernadette ascribes to keeping a complete, accurate list of events on a shared calendar. When Nathan did not include an evening work event, she became upset because the missing event exposed a gap between her expectation of visibility into Nathan's life and his use of his calendar. This situation also reflects how Bernadette expects Nathan to use their shared calendars in a way that reflects his desire to be answerable to their relationship. Ultimately, Nathan began synchronizing the calendar he shared with Bernadette with his separate, private work calendar so she could see know when he would be busy due to evening work events.

The process of becoming answerable requires the development of a mutual awareness of how to use shared calendars. Our participants develop their awareness through the offline discussions that result from misunderstandings about how to gauge the exactness of calendar entries. For example, Ivan told us how the use of his calendar initially differed from that of his fiancée, Joan, with regard to their different perceptions of "free" time. From Ivan's perspective, the end times of his events are simply rough estimates of when they will end. However, Joan took these times literally and assumed that Ivan would be free immediately after his scheduled events had seemingly concluded. As Ivan described the situation:

[Joan] used to take [event times] more seriously and used to try to schedule things…right after when I said I would be done. I remember one instance in particular: We wanted to go [rock climbing] with a friend of hers. And I said I would be done by 3:30, and 3:30 turned into 4:15, and they were trying to go climb while there was still daylight. And we were really late, and they were really upset.

Whereas Ivan sees his events more as reminders of activities that lack precise endpoints, Joan regards the lack of events as equivalent to free time and so she planned other events accordingly. Therefore, Joan is holding Ivan answerable for the structure that he created with his calendar by using his events as indicators of when he is busy, and the blank spaces as free time when he is not busy. Although both partners in this intimate relationship want to be socially accountable to one another, the ways in which they use OCS to express their perceptions of time required a recalibration of those perceptions. Ivan changed how he used his calendar to make himself answerable to Joan in the way she expected based on how she perceives time. Ivan told us about this process:

It was a combination of learning to use the calendar and [becoming] more comfortable with each other and our own needs in our lives.

Being answerable includes, but entails much more than, keeping accurate records and sticking to a plan, changing actual practice and actions in response to discussions about how to use shared calendars, and demonstrating that the needs of close friends and significant others are being

considered. The examples in this section reflect how, by tracing participants' interest in being answerable to their close friends and significant others, the events included within they shared calendars are meaningful to those who can view the calendars, as are the gaps between events. Additionally, although calendar events appear to have hard boundaries, not all OCS users regard their schedules in such inflexible terms. Because people bring these different ways of working with OCS to their calendar sharing practices, they must negotiate with close friends and significant others what it means to be answerable when performing calendar sharing as relationship work.

Being Explainable within an Intimate Relationship

Our participants use specific language and indicators to denote certain types of events that are more or less flexible than other events. For these events, participants write event descriptions that sometimes contain additional, highly contextual information that close friends and significant others are able to interpret and act on accordingly. This information can be more significant than the presence or absence of the events themselves because the additional context helps others know how they should act when they see such an event in a shared calendar.

Prior work [26] documents a similar phenomenon whereby OCS users rely on special event settings or codes to negotiate shared activities, keep their relationships vital, and manage different schedules. The present research explores in greater detail **how** close friends and significant others try to keep their relationships vital by tracing how they rely on shared calendars to judge whether they are acting accountably. Specifically, in this section we explore the calendaring techniques our participants use when they attempt to be explainable to others, a fundamental element of accountability and a necessity for keeping intimate relationships vital.

For example, Sarah told us that when she and her boyfriend Charles started sharing calendars, she would put events on her calendar and often not tell him, especially those that were very important to her.

when we first started sharing the calendar…I would just put down, "Oh, I'm going to the temple," and not say anything because I knew that we'd have an argument about it…so I would sneakily just put all these things on the calendar.

As their relationship developed and their time on weekends began filling up, Sarah realized that she needed a way to indicate to Charles which events she wanted to attend, but that she was flexible to his needs as well and could negotiate or sacrifice some of her events in favor of attending his. To resolve this issue, Sarah and Charles developed an event naming convention to help them differentiate between events that will definitely occur and events that require offline discussion before they are considered "real" events.

The big one that we use…is 'tentative.' And a lot of times I will put the brackets and then say 'tentative' so he knows that I am planning this but it's subject to his…I don't want to say approval, but, like, to his agreement that it's okay to do that… Like, 'These are all the days this month that I am planning on going to the temple. And is that okay?'

For Sarah, going to the temple is an important part of her week that is often non-negotiable, and so she does not describe that event as tentative. However, she also adds events to her calendar as a way to remember activities or outings that are potentially worth attending. Sarah notes those events as tentative so that Charles can look at her calendar and understand how she is planning to spend her time. This use of "*tentative*" enables Sarah to make herself explainable to Charles through their shared calendar. Sarah told us that the naming convention allowed her and Charles to have conversations about events that may be less essential, and to create space for shared time between them.

Alternatively, Ethan described how his girlfriend Nora felt that having too many events on a calendar could seem confining. Nora would often create an event that was explicitly named to suggest that no other events should be created within the same period of time. Her use of a specific phrase as well as a specific event duration became a calendaring convention that let Ethan know he should **not** schedule time with her.

She just doesn't like being locked down to commitments and so having a lot of documented appointments on the calendar is something she dislikes. So, sometimes she'll just have days where the event is not having events. This is a date where people are not allowed to schedule things...it'll just be a day event that says, 'Take it easy.'

This example reflects another way in which our participants make themselves explainable to their partners in intimate relationships. Although Nora could simply leave her calendar empty for the day, her "*take it easy*" event description makes it clear to Ethan (and others) that she does not want to be scheduled for any other events during that period of time. It is up to Ethan to decide whether his bond of trust with Nora is strong enough that he can honor her calendaring convention and see her another time.

Taken together, the examples discussed in this section demonstrate two different tactics that our participants use to make their plans and behavior explainable to others. Specifically, Sarah and Ethan add events to their shared calendars as conversation starters, whereas Nora relies on her "*take it easy*" event description as a clear statement to be left alone. In both cases, the event descriptions and the contextual information they provide are at least as important as the presence in the calendars of the events themselves. Someone who lacked the proper context could overlook the event descriptions and misinterpret the flexibility or purpose of the events, resulting in the need for clarification about what the calendar owners intended.

The next section explores how being accountable with and through OCS becomes more problematic when more than two people share the same calendar, and when calendar events are visible to people with whom the calendar owner is not intimately familiar. In particular, problems arise for our participants when they need to communicate specific information to certain individuals but not to everyone who can view the same calendar.

Being Accountable in Intimate Group Relationships

When OCS users share their calendars with people other than their significant others, they must consider how to act accountably to multiple individuals through their calendars. This broader consideration of how to behave accountably is especially challenging because, as our participants told us, it can be challenging to appear accountable to several people at the same time.

One way that our participants attempt to manage this situation is through their event descriptions. As described in the previous section, close friends and significant others sometimes use highly contextual event descriptions that other people might not understand. For example, one of our participants, Esther, shares a calendar with her husband, Frank, as well as three close friends. She labeled her wedding ceremony as "*lunch date*" and only invited Frank and a few friends as witnesses.

Instead of saying 'wedding day,' we called it a lunch date. We just really didn't want to share it with other people yet. And a lot of our friends knew, but, you know, we [secretly] put it on our calendar in advance.

Esther needed to put an event on her shared calendar so that she and her wedding guests would have time scheduled for the ceremony, but she did not want to alert anyone else about her wedding or her specific plans for the ceremony. However, Esther's close friend Christy added the event to her own shared calendar and changed the description from "*lunch date*" to something that indicated Esther's wedding plans.

Tyler, a close friend of Esther and Christy, saw this event in Christy's calendar and realized that he had not been invited to Esther's wedding ceremony. He consequently stopped sharing his calendar with both Esther and Christy. Esther was only able to repair her relationship with Tyler when she had a lengthy offline discussion with him about how small her wedding was, and why he and a number of other friends simply could not be invited. Even after a great deal of discussion about this situation, however, Tyler no longer shared his calendar with Esther or Christy.

Prior work has shown that the act of sharing a calendar is an emotionally meaningful event in an intimate relationship, an event that is not always tied to the need to coordinate time with another person [26]. However, as the situation with Esther makes clear, the decision to stop sharing a calendar can also signify an important milestone in a relationship. The decision to stop sharing is not necessarily because the need to coordinate no longer exists, but because the relationship itself is in jeopardy, as when the bond of trust between Esther and Tyler needed to be reestablished.

OCS use can help strengthen relationships as well: Sally told us how she and her group of close friends insert events into their shared calendars as a way to encourage interactional intimacy. She explained that they use an event with a specific name to indicate their desire to spend time with Leslie, one of their close friends.

Leslie recently has been in a relationship, and so she's been spending a lot of time with her boyfriend. And so, we told her that she had to maintain a one-to-one ratio between her friendships and her boyfriend. And so, you'll see on her calendar she has 'Recalibrate the ratio,' which generally means either she's having sex with her boyfriend or she is hanging out with us. So, sometimes when she's spending too much time with her boyfriend we'll put in, 'Recalibrate the ratio' as like, 'Hey, come spend some time with us.'

The use of *"recalibrate the ratio"* on Leslie's calendar demonstrates how the significance of a calendar event can come from its specific context as well as its presence. The event itself is important because it acts as a notification to Leslie that she needs to be accountable to her entire group of friends, both her boyfriend and her close friends, and the context with the event is significant because the presence of the event on Leslie's calendar forces her to ask what the current ratio of time spent amongst her friends is and which way it is out of balance. Beyond that, it forces her friends to consider both of these aspects as well. In some cases, *"recalibrate the ratio"* will appear on Leslie's calendar when her boyfriend is in town and she wants time with him, yet other times it will appear because her friends want time with her.

Our participants weave OCS into their lives as they attempt to behave in socially accountable ways with close friends and significant others. OCS are organized, continuously enacted social arrangements within which people represent their activities as calendar events, OCS users must take care to maintain awareness of the specific social expectations that apply to calendaring behavior. If they fail to do so, they run the risk of damaging the bonds of trust [25] that partners in intimate relationships construct over time as they support one another through their mutual commitment to their relationships.

DISCUSSION

The goal of this study was to address the following research question in the context of the enactment of accountability: *How do OCS users perform relationship work with and through their calendars*? We have addressed this research question by highlighting the processual struggles that partners in intimate relationships undergo when attempting to act accountably with and through their shared calendars.

In this section we consider the OCS design challenge posed by our findings: How can OCS help users through the initial learning process about shared calendaring norms and expectations? The goal is to discuss possible design interventions that could allow OCS users to more effectively supporting their negotiation and enactment of accountable behavior.

One of the biggest challenges with OCS use is the shift from "me-calendaring" to "we-calendaring," where calendar owners must realize that others will be using the information they store in their calendars. Specifically, when people first begin using OCS, they need to understand the differences in using a digital, shared calendar compared to using paper calendars and other forms of tracking one's schedule. For example, OCS users need to understand who else can see their events, as well as their titles and descriptions. While it is simple to develop this awareness when only two people share calendars with one another, it becomes tougher to trace who can see which calendar as invitations to share proliferate within groups of friends.

As calendar owners grant other people access to a shared calendar, the OCS should alert all users that changes have been made to the visibility of that calendar. Each new invitation to share is an opportune time for all calendar users to think about how their events will be interpreted by everyone else who can see and use the same calendar. This simple interface design change would allow OCS users to make decisions about how they want to be explainable to other calendar users; which events to track, how to describe those events, who they should invite, and so on.

Unlike colleagues who share Google Calendar simply to complete a specific project, close friends and significant others intend to continue scheduling their lives together forever, assuming their intimate relationships flourish and persist. One way to help partners in intimate relationships improve their ability to act accountably through their shared calendars is for OCS to offer better support for the scheduling of unscheduled time. Although this concept seems contradictory, the present work reflects the fact that people share calendars because they are quite busy and want to make time for one another.

Our prior work [26] touched on the possibility of "shades" of availability without extending that idea beyond musing about how people needed to decide on their own whether specific times could be considered available. However, our findings from the present study provide additional context that enables us to explore possible variants on the notion of "free" time. For example, OCS can include blocks of time that have differentiated levels of availability depending on who is viewing the shared calendar. Times could be shown as available for scheduling by anyone else, available only to a subset of calendar users, or entirely unavailable. The goal behind any such design changes is to enable calendar owners and users alike to generate and interpret contextual temporal information more easily than the indication of "free/busy" currently allows, or in Eriksén's words, to support the practices of being explainable.

Finally, partners in intimate relationships frequently add events to both of the calendars they share with one another, rarely sending actual invitations to events. A simple annotation system would allow OCS users to indicate how tentative their attendance might be, and whether attendance at a specific event is conditional based on other events. Selectable and customizable tags could help eliminate the need for complicated systems of textual notation within events, as well as other intricate calendaring conventions.

CONCLUSIONS

As other scholars have demonstrated [cf., 2, 19, 28], OCS support collaborative activity in part by enabling users to share their schedules of planned activities with one another. However, tools that are designed to support collaboration cannot entirely replace the variety of activities that people perform when they collaborate with one another [cf., 3]. Therefore, it is important for OCS to be designed such that the performance of accountable behavior is supported more effectively than at present, particularly considering that calendar sharing is relationship work [26] and that relationship work is predicated on acting accountably.

Given this importance of shared calendaring in people's lives, we concur with the value that [5] ascribe to designing "digital systems so that they mesh with human behavior at the individual and collective levels." Ultimately, OCS is only one channel of communication among many that are popular among partners in intimate relationships and across groups of friends. However, as technology has become increasingly interwoven into our lives, it is useful to consider how OCS can be designed to better support the accountability practices that are vitally important to the growth and ongoing health of the relationships we consider most important.

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