Tech-tied or tongue-tied? Technological versus social trouble in relational video calling

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Abstract

Maintaining a relationship via video calling requires intertwining relational and technological talk. Using detailed qualitative analysis of transcripts from naturalistic recordings of couples in a video calling field trial, this paper explores how couple members use the possibility of technological distortion as a resource for negotiating around the problem of inattentive or inappropriate responses. Inattention may be cast as technological trouble, and, conversely, the technology can be blamed for an apparently relationally inappropriate response. It is argued that research on technologically mediated relationship creation and maintenance should not treat technology as simply a container of relationships or a variably rich transmission system for relational material. Rather, mediation should be explored as a fundamental participant concern in online relationship research.

1. Introduction

Video calling is now a realistic distance communication option for couples, but the limitations of domestic Internet connections leave video calling vulnerable to audio/video distortions: choppy, clipped, muffled, missing, lagged, blurry, frozen, or desynchronized audio and video. As part of a larger research project that asks whether such audio/video distortions block intimate relational talk [30][31], this paper explores how some couples in a naturalistic two-month video calling trial used the possibility of audio/video distortion as a resource for coping with conversational inattention or apparently relationally inappropriate responses.

Suchman, Blomberg and Orr [37] have argued that "conversations among people succeed not because of the absence of troubles of understanding, but rather due to a wealth of resources available for their collective identification and repair". When distortions occur in video calling, producers experience their turn flawlessly but recipients experience the same turn as distorted. This creates an asymmetrical access to the detection of distortion. These asymmetries mean that determining whether slow or problematic responses are the result of technological distortion or some form of social issue that must be dealt with interactionally and may be relevant to relational maintenance.

It is argued that research on technologically mediated relationship creation and maintenance should not treat technology as simply a container of relationships or a variably rich transmission system for relational material. Rather, following local accountability of technology approaches to research, both good and bad aspects of technological mediation should be treated as part of maintaining online relationships and, indeed, as a fundamental participant concern. This is an extension of Hutchby's [18] notion of technologized interaction, in which technology frames but does not determine social action. Maintaining a relationship via video calling requires intertwining relational and technological talk to cope with asymmetries in communicative access.

The paper begins by outlining literature on video calling limitations, distortions, and video calling in the domestic context, followed by a description of the analytic approach and methods of data collection through naturalistic field trial recordings. Two transcripts in which the participants grapple with the issue of distortion versus inattention or inappropriate responses are then analysed to show the moment-to-moment relevance of technological mediation as a resource. The paper ends with a discussion of the broader issues of technologized interaction and research into technologically mediated relationship creation and maintenance.

2. Literature review

The computer-mediated communication field has long been interested in how people adapt to technological limitations to accomplish interpersonal relationships, especially in terms of how emotion and

presence are displayed when cues and channels are constrained [39][40]. Classic video conferencing and media space research has focused on whether the technology works as a simulacrum of physically co-present interaction [13][34], and how various distortions are perceived [19][16][41]. Quality of Service (QoS) research on the likely distortions resulting from network differences among consumer video calling services [21] or the noticeability of latency [14] rarely reports users' practices for managing distortions.

There has been some history of qualitative investigation of the way in which mediation might be a resource for interaction. Heath and Luff [15] were among the first to illustrate the conversational asymmetries of media spaces. Five years later Dourish et al. [7] reported on how these kinds of asymmetries lead to developmental changes in team members' understandings of a long-term workplace media space deployment. However, five years on again Ruhleder & Jordan [33] showed that for more ad hoc videoconferencing groups, distortions of interactional timing do impact upon conversational practices, especially expectations about answers to questions, affecting the comfort that users had with the situation.

Research on personal video calling has focused mostly on families, and has really only been possible since the early 2000 convergence of IP video calling codecs, broadband connections, and cheap computer camera and sound devices. Common to both family and relational video calling research, is the need for a re-imagined treatment of how intimacy is enacted at a distance [23]. Researchers have investigated the ways in which video calling personal presence and portrayal can be improved [3], the nature of mediated play [9], and the difference between video mediated interaction versus a shared two-way window into the life of two domestic spaces [20]. In the broader domestic context it has been shown that it takes considerable effort required to initiate, run, and troubleshoot domestic video calls [1]. This paper explores part of this effort, considering specifically how couples negotiate whether repairs revolve around technological issues (distortions) or social issues (inattention, inappropriateness), and how those negotiations themselves are relational enactments.

3. Analytic approach

The analytic approach of this paper draws on Hutchby's [18] notion of "technologized interaction", which itself combines the qualitative Sociological research paradigms of Ethnomethodology (EM), Conversation Analysis (CA), and Membership Categorization Analysis (MCA) with an operationalization of the concept of affordances.

EM investigates how practical understandings are a situated achievement [10]. CA focuses on sequential practices in talk [4], including repair as part of that sequential stream [8][35]. MCA explores the practices by which members propose states of social and moral order through direct and indirect categorical links or boundaries [17]. All three take the stance that repair of interactional troubles is reported and achieved within the same sequential stream as other interactional action [35]. They also argue that relationships do not consist of stable categories or solely internal attitudes towards others, rather, relationships are as much an interactional achievement as any other social fact [28].

Dourish [6] argues that EM/CA/MCA began to contribute to Human-Computer Interaction (HCI) research after Suchman's [36] pioneering work showed that technology has local and contingent accountability that extends beyond how its designers anticipate users' planned actions. This approach argues that researchers should investigate the "social production of technology", how "the facticity of technology is displayed, accounted for, and testified to in participants' activities" [2].

Gibson's [12] concept of affordances has also been a powerful influence on HCI [11][22][24]. In Gibson's framework, actors define what an object is, but the definition of what the object is depends on its stable actionable properties. The analysis of objects and people should thus focus on their interaction. Norman [24] and McGrenre and Ho [22] have clarified that affordances have an obvious counterpart in constraints: stable material properties of objects that limit action. That being said, not everything done or not done with an object is related to its material properties. Objects may have perceived affordances and constraints [24] that relate more to logical, cultural, or conventional possibilities for action than material properties.

Hutchby's [18] technologized interaction version of the local accountability of technology argument assumes co-present interaction to be the primordial site of social action, and then argues that interaction becomes technologized when participants adapt or create new practices of social action that orient to the unique affordances and constraints of a communication technology. Users constitute what is relevant about the affordances and constraints of technology through their interaction and, reflexively, interaction is constituted in terms of the affordances and constraints of technology. Technologically mediated relationships, in turn, are manifested through technologized interaction.

This paper addresses the issue of what technologized interaction concretely looks like in the context of online relationships. In so doing, it extends

the concept of perceived affordances and constraints to include the notion that, conversationally, affordances and constraints need only be a possibility rather than an actuality. In a sense, understanding a problematic response from a conversational partner involves determining whether or not the response problem is the result of technological distortion versus inattention or inappropriateness. That being said, regardless of the 'truth' of the situation, appeals to affordances and constraints may be used as conversational devices to serve social purposes.

4. Method and data

EM/CA/MCA rely on detailed descriptions of naturalistic recordings of participant behavior, searching for principles of context-free but context-sensitive interactional practices rather than generalizations of social order. When practices are clearly findable, large collections are used to argue on a saturation basis. In more exploratory projects, such as this one, the goal is to present detailed analyses that illustrate the practical work of social order.

Six couples in distance relationships of at least one year's duration were recruited in the North-eastern USA, supplied with cameras and video calling software, and asked to try video calling at home for two months. Couples in existing relationships were chosen so that issues with learning the technology were not conflated with getting to know one another. Users were chosen as novices so that their experience with learning the technology stood and had not become naturalized or routinized.

The self-selected couples were all native English speakers, under 21, college-educated, and primarily white. This group is not representative of the US population. They are, however, arguably representative of well-resourced members of the Millennial generation [38], who have grown up with technological mediation and represent the future of mainstream users' understandings of technology. According to PEW, 23% of North American Internet users have used some form of video calling, and users aged 18-29 are twice as likely (29%) to have participated in video calling than Internet users age 65 or older (15%) [29].

At least one member of each couple was in the North-eastern USA. The respective pair member was at least three hours drive away. Couple members were supplied with cameras and video calling software to try at home for two months. The couples were asked to talk for at least 20 minutes once a week, but no tasks were required. Apart from minimum technology standards, there were no other controls. All couples consented to an automatic remote recording system

capturing all video and audio from their conversations (detailed in [32]). The combination of technological and task freedom maximized the ecological validity of the recordings. It allowed for a very natural trial experience and although couples were aware that they were being watched, they quickly became used to the system and acted without much apparent conversational constraint [32].

As noted above, the analytic method is to explore how interactional turns propose slots for next actions and next turns ratify, modify, or resist the understandings of prior turns [4]. Analysing the flow of turns is particularly important because actions solicit responses that have both preferred and dispreferred turn-shapes [27]. Participants treat preferred responses without difficulty and treat dispreferred responses as requiring potentially requiring further work to understand. It is in his further work of understanding that participants can treat technological mediation as a conversational—and hence relational—resource.

This paper draws on just two of the six couples so that the moment-to-moment details of interactional choices can be shown in detail as opposed to glossed as 'blaming the technology'. Other couples did experience related moments [30][31], but the goal here is not to show diversity of approaches but rather the actual orderliness of technologized interaction. Further as will become clear, for the purpose of this paper it is irrelevant whether or not technological distortion actually occurred in each case. Rather, what is it issue is whether and how technological distortion used as a conversational resource.

The data for this paper is shown in the form of a simplified transcript using the following conventions:

- `(.)` Micro-pause (less than 0.5 seconds).
- `(n.n)` Timed pause, measured in seconds.
- `.h` In-breath.
- `:` When a colon follows a letter, the sound of that letter is extended.
- `text?` A question mark represents upward vocal inflection (often used for questioning).
- `text.` A period following a word represents downward vocal intonation (often used for turn completion).
- `-` A hyphen represents a cut-off, either during or immediately following a word.
- `=` An equals sign at the end of the last word of a turn and beginning the first word of the next means that the words are latched (spoken immediately one after the other but not simultaneously).
- `[text]` Text/action enclosed in square brackets in directly adjacent turns is

spoken/accomplished simultaneously by two participants.

- *@text@* Text enclosed in the at symbol and italicized describes physical action.
- /text/ Text enclosed in backslashes describes a vocal intonation.

5. Technology trouble as a resource

5.1. Casting inattention as technological trouble

The first example, which comes from the first conversation of this couple, involves casting inattention as potentially caused by audio distortion. In the first few minutes of this call, Des and Kay experienced a great deal of audio distortion and some video distortion. These were smoothed out with use of the application's bandwidth settings and the couple spoke without technological difficulty both before and afterwards. The inattention stems from the fact that Kay had been watching *My Fair Lady* when the call started and she had kept an eye on the movie throughout the conversation. In the transcript below, Des casts Kay's lack of attention as due to audio distortion, even when Des knows it is not the case and Kay admits that it is not the case. Why do both parties go to such extremes? It appears that treating lack of attention as technological trouble allows them to avoid relational tension that lack of attention might otherwise provoke. Des is more interested in recapturing Kay's attention than blaming her for inattention.

Example 1: Case010-p01-c01of09-t01a3022-in30m24

```
1.  KAY:  @looking off-camera@ How was the movie
2.  DES:  Oh it was good (.) It was very
3.        exciting you should go see it
4.  KAY:  Yeah that's what Gavin told me but
5.        I've never seen it
6.  DES:  What
7.        (4.0)
8.  DES:  What did you say?
9.        (1.5)
10. DES:  Hello?
11.       (1.5)
12. DES:  Hello?=
13. KAY:  =huh?
14. DES:  I [said] what did you say?
15. KAY:  [what]
16. KAY:  I said Gavin told me the movie was
17.       good too but... @looks away@
18.       (3.0)
19. DES:  You don't want to see it? (0.5)
20.       @opens mouth wide, raises eyebrows@
21.       (3.0)
22. DES:  Cut[ie?]
23. KAY:     [@looks at camera@]
24. DES:  Can you hear me?
```

```
25. KAY:  Yeah what did you say?
26.       (2.0)
27. DES:  You said you didn't want to see the
28.       movie?
29.       (1.5)
30. KAY:  No @looks at camera@ oh Gavin said it
31.       was a good movie too
32. DES:  Ha ha ha .h [Okay @smiles@]
33. KAY:             [@Looks off-camera@]
34.       (3.0)
35. DES:  Hmm @Purses lips to left@ I see I see
36.       Are you watching your movie right now?
37.       (2.0)
38. KAY:  @Eyes dart right to off-camera focus
39.       then roll back left to on-camera focus;
40.       smiles@
41.       /'Caught lying' intonation/ N:o
42. DES:  Wha::t @smiles; holds microphone@
43.       Are you having trouble hearing me again?
44. KAY:  No
45. DES:  Oh it seems- you look real confused
46. KAY:  @smiles@ No @opens mouth@
47. DES:  @rolls eyes@
```

The sequence starts with Kay requesting that Des assesses a movie that he saw the prior evening (line 1). As trivial as this may seem, this question represents one of the myriad consequential moments in relational maintenance; it looks like the opening move of one of the fundamental things couples do: share preferences for things. Kay is looking off-camera as she asks for the report, her attention split between the call and *My Fair Lady*, but nevertheless such a question projects an extended discussion about the movie. At the very least it is projectable that having requested an assessment in a first turn, and receiving in in the second turn, Kay's will respond to the assessment in a third turn. So Kay's conversational responsibility projects beyond just providing Des a slot for assessment.

Des, for his part, provides both an assessment and an upgraded assessment, and then goes on to recommend that Kay should see the movie herself (line 3). Kay's attention is still on *My Fair Lady*, but she does provide a response. She confirms Des's assessment by reporting that she has heard a similar assessment from a third party, and then follows this with a contrast marker and report that despite this she has not seen the movie (lines 4-5). Kay does not indicate why she has not seen Des's movie, nor does it indicate that she will see it having now heard Des's positive assessment.

It is at this point that trouble begins. Des produces an ambiguous repair initiator, "What" (line 6), but by now Kay's attention is wholly devoted to *My Fair Lady*. She disattends Des's repair initiator (line 7). Des produces a second, elaborated, request for repetition of Kay's prior turn. This second request for repetition ("What did you say?"; line 8) clarifies the ambiguity of the first repair initiator. Des pauses for Kay to answer, but with no answer forthcoming he produces a

summons ("Hello?"; line 10), waits again, and repeats the summons (line 12). He thus momentarily suspends interest in the information for the more fundamental interest in checking the connection.

Kay's non-responses are indicative of trouble, but from Des's perspective the cause trouble is at least potentially ambiguous. Des knows that Kay's attention is split between him and *My Fair Lady*, but he also knows that audio distortions can occur and that Kay may not be hearing him. Establishing the possibility of trouble with technological mediation becomes a necessary part of the interaction.

Latched to Des's summons, Kay herself provides a repair initiator ("huh?"; line 13). While this indicates some form of difficulty with the prior turn it conveniently doubles as a proof of at least some audio connection with Des. Des casts Kay's repair initiator as having not heard his prior request, so he repackages his own repair initiator as a report ("I [said] what did you say?"; line 14). Prefixing the request with a report of speech proposes that the couple is in the midst of ongoing conversational trouble. The cause—distortion of inattention—is unspecified but the use of the report formulation is common in expressing annoyance at repetition, which is in turn common in situations of dealing with a recipient who is not paying attention.

During the request, Kay produces a second repair initiator ("what?"; line 15) but in lines 16-17 she attempts to respond to Des's repair and the conversation is apparently back on track. Kay repeats the first half of her report of Gavin's assessment, but then trails off. Her turn is mindless repetition drawn from short-term memory rather than engagement in interaction. The long silence of line 18 indicates Des's ambiguity over whether Kay is still talking (or perhaps thinking) or whether she is handing the floor to Des having apparently fulfilled her responsibility. At this point Des can be in little doubt that inattention is perturbing the conversational flow.

Des breaks the silence (lines 19-20) by attempting to get Kay to explain why she has provided a contrast marker ("but"; 17) after an otherwise positive report. His candidate answer question ("You don't want to see it?"; 19) is followed by facial movements that indicate that he is waiting for a response (opening his mouth wide and raising his eyebrows). Kay, however, does not see Des's facial expressions, as her attention is still on *My Fair Lady*, leading to another long pause (line 21). At this point Des can see Kay, so he knows that at least the visual connection is working, and, despite the silences, can be fairly sure that she can hear him. Nevertheless, rather than accuse Kay of inattention, he engages in a second round of connection checking.

Des first attempts to summon Kay with the intimate referent "Cutie" (line 22). The use of an intimate referent places a moral valence on the obligation to answer the referent. Kay looks toward Des at the end of "Cutie" (line 23), but Des continues with a verbal check on his hearability ("can you hear me?"; line 24). This check is a direct test of distortion versus inattention. Kay confirms that she can but then requests yet another repetition (line 25), showing the problem quite directly to be one of inattention. Des repeats his candidate inference that Kay does not want to see the movie ("You said you didn't want to see the movie?"; line 27-28). He does so using a question format. He is, then, providing an obvious slot for Kay to respond.

Des's tactics through most of the prior turns has been to move the conversation along by recapturing Kay's attention through the use of turns that require answers. Unfortunately, while Kay's answer to Des initially appears responsive ("No"; line 30) she resets her talk to the last point in the conversation when she was paying attention ("oh Gavin said it was a good movie too"; line 30-31). Kay appears to have entered into a loop in which all stimulus is perceived as the almost the same and is thus met with almost the same answer. The interesting thing is that Kay is aware enough to perceive Des's candidate formulation of her talk as not capturing her personal position on the movie but not aware enough to perceive it as indicating that Des has moved on.

Des's laughter and acknowledgement (line 32) show him to be giving up on moving this part of the conversation forward. For her part, Kay looks off-camera again (line 33). Des finally moves to a direct check on the suspected non-technological cause of Kay's inattention ("Are you watching your movie right now?"; line 35-36). Kay is a little slow to respond (line 38-41). Kay's change of gaze from *My Fair Lady* to the camera is a swiveling eye movement in which is produced to be seen (as opposed to produced and seen by accident). This eye movement is accompanied by a smile and an ironic disconfirmation ("N:o"; line 41), which propose Kay as having been 'caught' but that her inattention should not be treated seriously.

The couple is thus now involved in the social problem of overcoming Kay's inattention. It is here that Des, flouting the obvious, decides to treat the possibility of troubled technological mediation as a conversational resource. While Des could sanction Kay for inattention, he instead chooses to question it a candidate question that reformulates inattention as technological ("Wha::t @*smiles; holds microphone@* Are you having trouble hearing me again?"; line 42-43). This candidate of trouble arising from technology is possible because distortion has indeed occurred previously in this conference and unresponsiveness is a cue for distortion. That being said, every time Des has pursued this unresponsiveness, Kay has demonstrated

that the connection is operating correctly. Ratifying Des's reformulation would allow Kay an excuse for the moral offence of inattention if she chose to take it. However, it might also lead to Des following up the technological trouble, which would cause more problems if Kay later admits to having misled Des.

Kay disconfirms distortion (line 44), leaving inattention as the unspoken but obvious issue. Des does not sanction Kay (line 45). Instead, he responds with a change of state token ("Oh") followed by a cut off perspective marker ("it seems-") and that is replaced with a different candidate ("you look real confused"; line 45) that again sidesteps inattention by looking to the result rather than the reason for inattention and by marking this as from Des's perspective, which softens the accusation. Although the issue is no longer distortion versus inattention, Des avoids accusing Kay of inattention by trying to collaboratively develop an account for the breakdown of the conversation.

Kay's "No" (line 46) is produced very slowly and deliberately along with a wry smile. This indirectly admits the only other logical possibility: that she has been inattentive. However, it is also a sort of play. It is the third slow "no" in a row, retrospectively adding up to a joke about 'slowly saying no to everything' and moving the interactional focus to joking. Rolling his eyes (line 47) Des indicates an resignation and the pair move to new topic thereafter. The problematic situation has been defused.

Although this instance is unique to this couple, the upshot should hold across many situations. The possibility for technological unresponsiveness can be uncomfortably close to interpersonal unresponsiveness, which might mean that ruling out technological unresponsiveness may be relationally awkward. On the other hand, technology is eminently blameworthy and can provide a way out of awkward situations.

5.2. Blaming the technology for an apparently relationally inappropriate response

The second example is taken from the last conversation of Cam and Kim. It demonstrates similar sequential development of a local relational epistemic in which the possibility of audio distortion is a conversational resource. In this case, Cam disputes Kim's claim that he does not remember a relationally relevant prior conversation by blaming audio distortion for a response that treated as relationally inappropriate.

Example 2: Case137-p05-c11of11-t03p4236-07m12in
```
1.  CAM:  It's a very good song
2.  KIM:  Is that from the nineties?
3.  CAM:  It is from the nineties
4.  KIM:  Wait wait what song is that again?
5.  CAM:  What?
```

```
6.  KIM:  What song is that again?
7.  CAM:  That was r- Face Down by the Red
8.        Jumpsuit Uprise @looks at third
9.        party in room@
10. KIM:  Oh that's ri:ght
11. CAM:  @Nodding@ You probably heard it from
12.       my Xanga
13. KIM:  No
14. ---20.0 TALKING TO THIRD PARTY---
15. CAM:  That was Bob, Jamie's friend
16. KIM:  I know him
17. CAM:  Wow the resolution today is really
18.       good (1.5) su- @Waving hand@
19.       can you see me really good . or no?
20. KIM:  Uh huh
21. CAM:  I can see you very good
22. KIM:  We had that whole conversation about
23.       Red Suit Uprise=Red Jumpsuit Uprise
24. CAM:  Who?
25. KIM:  You and I, see you don't remember
26.       any of it
27. CAM:  Wait no I can't hear you because
28.       you're breaking up on me
29. KIM:  .h I said, we had this whole
30.       conversation
31.       ab[out Red Jumpsuit Uprise]
32. CAM:    [Yes I know I-]
33. KIM:  [and ]you don't remember
34. CAM:  [yep ]
35. CAM:  I do
36. KIM:  Don't remember
37. CAM:  You know how I remember?
38. KIM:  Don't [remember]
39. CAM:        [You could-] you could check-
40.       you could check my Xanga page
41. KIM:  You don't remember
42. CAM:  Oh shush you
```

The transcript begins while Cam and Kim are playing music to one another. Cam has played a song that Kim knows but cannot place. Cam names the song and the band (lines 7-8) and Kim indicates remembering (line 10). Cam claims that Kim would have heard it on his blog (line 11-12), but Kim denies this (line 13). The denial implies that Kim had knowledge of the band external to Cam's blog. A third party enters Cam's room, distracting them from the band issue.

When the third party leaves, Cam returns to the conversation with Kim by positively assessing the video resolution (17-19). Kim responds to the video assessment with a minimal confirmation ("uh huh"; line 21). Cam upgrades his video resolution claim in a second assessment ("I can see you very good", line 21), proposing that Kim should take more interest.

Despite the intervening 20 seconds of talk to a third party and Cam's focus on the good video resolution, Kim returns to treating the disagreement over the band as still a live issue (lines 22-23). Kim is proposing that resolution assessment is more Cam's issue than her issue, that good resolution may be momentarily newsworthy but ultimately it should be a state treated as normal, and most importantly, that there the

relational history issue is more important than discussing technology. It is at this point that ambiguity forms the basis of an interactional tussle between a relational issue and a technological issue.

Cam's responds to Kim's claim that "We had that whole conversation about Red Suit Uprise=Red Jumpsuit Uprise" with the repair initiator "Who?" (line 24). Most conversational repair-requests are proposed immediately following the problematic item [8][35], and arguably Kim's self-repair of the name of the band during her claim ("Red Suit Uprise=Red Jumpsuit Uprise"; line 23) is the most locally apparent moment of local trouble. Whether Cam was listening to the first (incorrect) version or had difficulty understanding Kim's self-correction, it is locally understandable that his repair request refers to the band's name.

However, Kim's response is to treat the band name as not at issue, perhaps because she had in fact produced a self-repair. If that is treated as already repaired, the only other relevant repairable to which "Who?" can refer is her initial referent "We". On that basis, she unpacks "We" as "You and I" (line 25), which forms the basis for an accusation of Cam not remembering a relationally relevant prior conversation ("see you don't remember any of it"; line 25-26).

It is at this point that Cam calls for a halt ("Wait"), denies the accusation ("no"), and then reports audio distortion ("I can't hear you because you're breaking up on me"; line 27-28). The halt proposes that conversation cannot continue until the repair has been dealt with, the opposite tactic from Des's attempts to pull Kay through inattention by using checks on technological trouble in Example 1.

The report of hearing trouble indirectly proposes that the repair initiator "Who?" was not related to a problem of relational memory but of audio distortion, and is thus part of Cam's denial of Kim's accusation. Kim, however, responds to claim of distortion with a reported repetition of her prior turn ("I said, we had this whole conversation"; line 29-30, 33). As with Des above in Example 1, the "I said" preface is used to indicate exasperation or annoyance with the need to repeat, upping the accusatory nature of the claim. Cam tries to resist the accusation, first in overlap (line 32, 34), then with a counter-claim (lines 35, 27, 29-40) while Kim repeats versions of her accusation (lines 36, 38, 41), until Cam ends the disagreement with a directive for Kim to be quiet (line 42).

Throughout Example 2, Kim is so focused on proving her own knowledge of the band, and that her self-repair of the band name left the only relevant repairable to be Cam's memory of the prior relationally relevant conversation, that she does not accept Cam's claim that distortion is to blame. Her repairs after Cam's direct report of audio distortion ("you're breaking up on me"; line 28) accepts that Cam may require repetition, but she treats that as a need to repair the entire prior turn, not the possibility that Cam may be have had trouble hearing just one part of it: the all-important relational referent "We".

6. Discussion and conclusions: Technology as a frame and a resource for meaning

While the concept of 'blaming the medium' is not new, that is not quite what is going on in these two examples. Concretely, the way in which technologized interaction is manifested context of relational video calling is in the ways couples negotiate the asymmetrical access to distortions in that producers have as opposed to recipients. Schegloff, Jefferson, & Sacks [35] argue that in co-present interaction, because producers and recipients hear the same turn produced in the same way at the same time, repair in interaction is organized to prefer self-repair. Producers have first access, so they get to set the orientation to the agenda for the repair. Recipients do not have to go along with that, but they will have to respond to it in some way. Technological mediation changes the access to the experienced production of turns.

In video calling, producers experience the turn live but recipients experience an electronic reproduction of the turn. Recipients are materially afforded the first access to the agenda of repair. Producers, by contrast, are materially constrained to a position of response to recipient repair initiations, although they do not have to follow the agenda of the initial recipient. When technological distortion occurs, obviously, the biggest change to repair will be that trouble can be attributed to technology, which has ramifications for the kind of repair that can be attempted. Thus two sets of material frames are brought to bear on technologized interaction when distortion occurs: the base sense of technological transmission/reception and then the relevance of distortion of transmission/reception. That being said, participants are free to generate and argue about meaning using these frames in any way they wish, hence, mediation and distortion are interactional resources for participants. These concepts can be seen in both of the examples above.

In Example 1, after a check for potential distortion turns out to be negative in response to repair initiations from Kay, Des repeatedly cast Kay's obvious inattention as potentially still originating from technological distortion. In so doing, both Des and Kay avoided any serious issue of relational blame. This is the clearest example of a substantially imaginative treatment of technological mediation as a conversational resource.

In Example 2, when technological distortion occurred, initial producer Kim experienced her turn as produced without distortion, but initial recipient Cam claimed to experience the same turn as distorted. Since only initial recipient Cam had direct access to of distortion, Cam had first access to the frame of repair initiation. Cam highlighted distortion of transmission/reception as at issue. In so doing Cam attempted to rule out the relational implication of his repair. However, initial producer Kim did not accept that technology was to blame, perhaps because she happened to have enacted a self-repair due to a rare combination of self-production error and technological distortion. Kim continued to refuse Cam's blame of the technology, leading to ongoing negotiation about the relational import of the repair.

As discussed above, Hutchby's [18] technologized interaction version of the local accountability of technology approach proposes that users constitute what is relevant about the affordances and constraints of technology through their interaction and, reflexively, interaction is constituted in terms of the affordances and constraints of technology.

This paper uses but also extends the technologized interaction approach in the way that it relates to affordances and constraints.

First, it is argued that Norman's [24] concept of perceived affordances and constraints should include the notion that, conversationally, affordances and constraints need only be a possibility rather than an actuality. Regardless of the 'truth' of the situation, appeals to affordances and constraints may be used as conversational devices to serve social purposes. In both examples above, participants treat the possibility or actuality of technological mediation as an accountable resource for directing the negotiation of repairs in interaction. Technological trouble, real or appealed to in potential, is not simply deviant 'noise' to be remedied. The technologized interaction approach refocuses attention from mediation as externally imposed effect to how participants treat troubled technological mediation as relationally relevant.

Second, research into technologically mediated relationship creation and maintenance should more directly address operational problems as constraints, and participant orientations to operational problems should be treated as a fundamental issue. Constraints (like affordances) are usually construed as stable, permanent, persistent, designed features of a technology that exist as part of correct operation of the technology. Correct operation in this sense does not mean that the technology is used correctly, merely that it is operating as designed.

Take, for example, the fact that webcams have a restricted field of view and the person being viewed physically controls what is in that field of view. They are straight-forwardly arguable as constraints that lead to technologized interaction: to see something out of the field of view in the remote environment requires the local user to negotiate viewing rights with the remote user. Just how this is raised, the rights to be negotiated, and the meanings generated are all interactional achievements of the participants. These negotiations are framed by the design of the technology but, at the same time, this framing is a resource that participants will treat as relevant to social action. These issues exist as part of correct operation, not operational problems.

Operational problems such as audio/video distortion in video calling are not part of correct operation. They are unintended exceptions, errors, and glitches that are random, temporary, and different for different users. Operational problems are a result of the design of a technology, but they are not part of the way the technology is supposed to augment social action. By the standard definition, then, operational problems would not be considered as constraints. Indeed, most socially focused communication technology research has concentrated on constraints of the physical or interface features of communication technologies and generally treated audio/video distortions, network trouble, and other operational problems as engineering problems that are outside its purview (e.g. [39]).

However, this paper argues for a wider notion of constraint because the heart of the concept—at least as it is linked to technologized interaction—does not rest on whether operational problems are the result of deliberate design, or correct or incorrect operation, but rather whether and how users treat any aspect of technological mediation as relevant to the task at hand.

Adaptive Structuration researchers speak of technology having a 'spirit', a sense of promise that it holds for users based on the design. DeSanctis & Poole [5] consider spirit as being set by the designer, and one of their interests is why users may or may not use a communication technology in the 'spirit' in which it was designed. Orlikowski [25] argues that 'spirit' is not simply set by designers such that use either follows or deviates from design. Rather, the 'spirit' of a technology is embodied in how users enact technologies-in-practice, fitting design elements to their existing social structures or accounting for why a technology does not fit these structures. Orlikowski & Iacono [26] further argue that workarounds develop uses of technology not intended by the designers.

Borrowing from the Adaptive Structuration perspective, it is argued here that operational problems are necessarily constraints because they impact upon social action and are accounted for in social action. In video calling, Audio/video distortion is an ongoing

constraint on the fundamental video calling affordances of seeing and hearing remote interlocutors. Words, turns, gestures, and facial expressions become the subject of repair because audio drops out or is choppy, or video is pixelated, frame rates are slow, or images freeze or do not appear at all. Determining whether or not repairable talk stems from technological or social issues is relevant to conversational continuity, which is, in turn, the lifeblood of maintaining a technologically mediated relationship.

6.1. Limitations and future directions

This exploratory paper is clearly limited in scope. Beyond the obvious limits in sample size and demographics there are many different forms of technologically mediated relationships that would cope with the negotiation of distortion versus inattention or inappropriateness differently. In terms of romantic relationships, there would likely be large differences in relationship creation and initial germination as opposed to the ongoing relationships in this study, and, indeed, relationships of many decades would be likely different again. Relationships that are born and remain online would be very different to those, again as in this study, in which the participants do meet physically on occasion. While sexuality may make little difference, clearly sexual intimacy itself would likely involve very different forms of negotiating technological mediation, especially in cases of operational problems.

Ultimately, for any relational context, this paper argues that research on technologically mediated relationship creation and maintenance must go beyond treating technology as simply a container of relationships or a variably rich transmission system of relational material. Research into technologically mediated relationship creation and maintenance should expect that an integral part of establishing the local relational epistemic will involve participants constituting themselves in ways that intertwine technological mediation with enacting the relationship.

7. Acknowledgements

8. References

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