

The social construction of a Glasshole: Google Glass and multiactivity in social interaction

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ABSTRACT

This article concerns the smartglass technology Google Glass (GG). Five different settings with different participants have been video recorded and analysed. The article builds upon ethnomethodology and conversation analysis with a focus on how the intersubjective turn-taking system is challenged when a participant is using GG. The article presents three overall issues and associated analysis of three examples of GG use in multiactivity settings. The analysis shows how 1) object orientation and identity, 2) private experience and knowledge, and 3) turn-taking and participation are key issues in GG-related multiparty and multiactivity social interaction. The term Glasshole, which has been used in the media for people using GG in somehow rude ways, is in this article more precisely understood as a person being conversationally inappropriate in terms of e.g. misspeaking, producing overlap, and producing unfamiliar actions such as staring out into the open robotically. The article concludes by discussing implications for future design, with a focus on future technologies' ability to provide information that fits into real-time social interaction.

Key words: *Google Glass, smart glasses, Conversation Analysis, Ethnomethodology, ICT, mediated settings.*

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1. Introduction

This article shows how GG is interwoven into social interaction, with focus on how it interferes with the socially organised turn-taking system. Digital technologies are generally influencing many aspects of communicative behaviour, including new participant frameworks; who can communicate with whom and how; new language practices; and relationships between space and time, presence and absence, and dominant and subordinated interactions (Keating, Edwards, & Mirus, 2008). This article focuses not on the interface or interaction design of GG but instead on the socially organised microecologies of people acting in focused encounters as well as how the use

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of GG fits into this organization. The article offers detailed analysis based on semi-experimental but naturally occurring interaction in real-time processes and social contexts.

I begin by describing the new kinds of smart technologies and then move on to a short description of the theoretical approach and introduction of the data. Three different examples from the data corpus will be used in order to show how 1) *object orientation and identity*, 2) *private experience and knowledge*, and 3) *turn-taking and participation* are key issues in GG-related social interaction. The overall argument, which is expanded upon throughout the article, is that GG is used and oriented to as an unfamiliar object in a multiactivity setting, i.e. the social, interactional, and temporal features of the situations in which people organise multiple activities together (Haddington, Keisanen, Mondada, & Nevile, 2014, p. 5).

The term *Glasshole* (Lawler, 2013) has emerged as a popular label for GG users who do inappropriate things in social interaction. Rebecca Greenfield (2013, p. 1) defines *Glasshole* as “an endearing term used to describe people who do not use the gadgets in socially acceptable ways.” This article shows in detail why GG has been met with such criticism and shows that this is not necessarily down to the type of people using GG but instead concerns the affordances of the technology and hence the types of actions GG enables and restricts.

Heidegger (1977, p. 43) said, “Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral.” This article is not a pessimistic critique of technology or mediated interaction in general but it is a contribution to a more objective and detailed understanding of GG as a non-neutral, non-human participant in a multiactivity setting. The question is not whether technology is good or bad but rather how participants in interaction precisely coordinate talk and other embodied activities to make sense of and accomplish whatever it is they are doing, while using or orienting to GG.

2. Smart objects in social interaction

‘Internet of Things’, ‘ubiquitous computing’, ‘pervasive computing’, and ‘augmented reality’ are rather new terms for the general public, which perhaps shows that intelligent technological objects are becoming more and more integrated into the physical world. These terms all address the same overall technological development, which is a trend

towards things being enriched with the ability to communicate with their surroundings. Most everyday technologies such as elevators, automobiles, microwaves, watches, and so forth depend on microprocessors for their ongoing operations, and these are increasingly being made smart through sensors and Internet connections.

Many new products are emerging as smart objects in a smart environment (Suresh, Daniel, Parthasarathy, & Aswathy, 2014). Engineers and researchers speak of smart cities, smart buildings, smart homes, smart cars, and smart objects in the home (such as the hyped NEST product, which is an intelligent thermostat purchased by Google), not to mention the subdivision of wearables.

Wearables are smart objects that the user can wear on his/her body, keeping the user's hands free, such as the Fitbit arm bracelet, broaches, rings, and necklets as well as the most-discussed accessories: smart watches such as Apple Watch and smart glasses such as GG and Microsoft's Hololens.

There are many different types of smart glasses on the market or in the pipeline today.¹ However, GG has taken the market lead and brought about the hype. The prototype Version 1 is not on sale to consumers but is used in enterprise. A new version of GG will probably be on the market in 2016.

GG is a minicomputer attached to a frame and is worn like ordinary spectacles. It projects a screen in front of the user with information from Internet searches, calendar, time, weather, maps, news, or whatever app is installed on the computer. In addition, GG can take pictures and record video. It is thus like a smartphone worn on the head: a wearable heads-up display computer. It is managed through talk and a touchpad on the side. The user may, for instance, say, "Okay Glass (Command 1)... take a picture (Command 2)," and GG will do so – if it recognises the speech. New versions of GG will likely look more like ordinary spectacles. However, the basic functionalities will probably be the same: the ability to communicate and be connected with the world while still having one's hands free – a so called Heads-Up Display (HUD).

As Dreyfus (1986) highlighted in his critique of artificial intelligence, technology does not make sense by itself. It is in everyday and often social practices that technological devices and solutions emerge as meaningful – or not. In parallel with Dreyfus' considerations, a key concern in this article is how participants' use of wearables such as GG when alone differs from their use of wearables in social settings. Humans are

¹ For instance, Optinvent, Epson Moverio, Atheer One, Recon Jet, Vuzix, Meta spaceglasses, Weon Glasses, Chipsip, Laforge Optical, Epiphany Eyewear, Kopin, Sony smart glass, Glass Up, Lumus DK40, Lenovo smart glass, Xoeeye Technologies, Innovega iOptik, 4iii SportIII, Microsoft Hololens, and Osterhout R7.

always already thrown into the social world, experiencing and acting in relation to one another (Schutz, 1976; Merleau-Ponty, 2002). Meaning is not a solipsism project for each and everyone but is instead embedded in everyday social interaction (Garfinkel, 1967). As a result, for example, since gesturing and talking to GG when alone requires an intuitive and comprehensive interaction design and interface (Rogers, Sharp, & Preece, 2011), using GG in a social setting also requires coordination with relevant actions at relevant times that is meaningful to co-participants on a turn-by-turn level. This has, from a HCI-perspective, been observed from almost the beginning of the development of wearables.

Starner et al. (1999) describe, for instance, how they have been engaged in an experiment incorporating wearable computing into their everyday lives. In the article (ibid.), they report their observations concerning the perception and adoption of the new technology, interface issues, and privacy issues related to the intimate use of wearable computing and its many social implications. However, this research has only been conducted on the basis of anecdotal data and with a strong focus on device functionality, often coupled with a cognitivist focus on the device as an extension of the self (see also Starner, 2013a, 2013b; Starner & Martin, 2015). From a social interactional viewpoint, however, there is huge difference between using GG alone and using it among other people in social interaction.



Figure 1. Farmer wearing GG when performing farm work with cows.

Figure 1 shows a Danish farmer using GG to send and receive information about his cows (data and settings will be presented later). When alone with his cows, the farmer still needs to be aware of the object's possibilities and constraints, but there are no larger social issues at stake in his near presence – although his interactions with the cows and registration systems are very different than, for example, using paper and a pencil. However, when the farmer is interacting with employees, GG, as a knowable and accountable object, is made relevant through interactional orientations. This article

specifically focuses on how object orientation and identity, private experience and knowledge, and turn-taking and participation are issues at stake when using GG in social interaction. This will be shown in the analysis. First, I set forth some considerations about this article's methodological approach.

3. Methodological approach

So far, research on smartglass technology use has primarily taken an HCI standpoint. This research tradition has contributed many valuable insights regarding smart objects as wearables (Mann, 2014) and GG specifically (Starner, 2013b). However, a multimodal conversation analytic approach based on video recordings is suitable for understanding the social interactions and not just the computer interactions.

This approach concerns how people build actions by combining resources with diverse properties (e.g. modalities of talking, gazing, touching, gesturing, and artefacts), which expands the repertoire of possible action available to participants (Streeck, Goodwin, & LeBaron, 2011).

CA-oriented work has provided understanding of the whole user situation in which technology is embedded (Heath & Luff, 1992b; Heath, Luff, & Sellen, 1995; Hindmarsh, Fraser, Heath, Benford, & Greenhalgh, 1998; Fraser et al., 2000; Luff et al., 2003; Suchman, 2007). Books such as *Interacting with Objects* (Nevile et al., 2014) and *Multiactivity in Social Interaction* (Haddington et al., 2014) show how the social, interactional, and temporal features of situations and conduct in various settings are constituted through multiple activities moment-by-moment in timely and coordinated ways.

Research within this methodological framing has demonstrated how the temporal and sequential aspects of activities are constituted (e.g. in ordinary talk (C. Goodwin, 1984) or in institutional contexts, such as in a hospital or surgery environment (Mondada, 2011)) and how there specifically exist multiple demands when interacting in social contexts with technology, such as in working environments like control rooms (Heath & Luff, 1992a; Nevile, 2007; Arminen, Koskela, & Palukka, 2014), when driving and using mobile phones (Haddington & Rauniomaa, 2011; Nevile, 2012), and using computers (Keating et al., 2008; Keating & Sunakawa, 2010; Levy & Gardner, 2012). These and similar research papers have shifted the analytical focus from individual cognitive multitasking to the social organisation and accomplishment of multiactivity.

GG may be seen and understood as a type of computer, and hence interaction with GG in social contexts may be seen as a computer-mediated environment. Many of the same multiactivity issues are probably at stake regarding, for example, turn-taking and epistemic status, but with GG everything is also quite different, especially regarding the familiarity of the object and the fact that participants are not communicating with each other online – which is often the focus in Computer Mediated Communication (CMC) (Garcia et al., 2009; Tudini, 2012; González-Lloret, 2013) – but instead in a face-to-face setting where only one of the participants is using/wearing the ‘computer’.

Furthermore, a multimodal CA approach emphasises that interaction, cognition, and work are inherently multimodal affairs, which cannot be studied on the basis of what goes on in a single ‘channel’ alone, e.g. what matters is not just talk but all types of semiotic systems, such as using objects and gesturing. The key analytical task within this approach is to focus on the sequential development of interaction in context, and the basic guiding question is *why that now?* (Schegloff & Sacks, 1973). This should ideally be studied in a natural environment. However, it is difficult to collect naturally occurring interactions with people wearing smart glasses since very few people actually wear them at the moment. As an alternative, I have partly used quasi-experimental methods in order to construct situations that simulate naturally occurring interactions and situations. They are quasi-experimental in the sense that they do not follow standard experimental design regulations with efforts to control causalities, contamination, spurious inferences, etc. (Lynch, 2002) but are case studies in which participants are asked to participate. The different settings were all contemplated differently but all with a focus on trying to build a setting in which naturally occurring interaction could intuitively appear. In each case, we invited participants to be at specific locations at specific times and to use GG when appropriate. The users were all instructed in how to use GG before the case study.

Data has been collected from five settings in Denmark, and all of the participants spoke Danish during the cases. I also undertook an autobiographical ethnographic study, wearing GG over the course of a month in everyday situations (Due, 2014b, 2014c). The research project was designed with this variety in methods and settings in order to gain a comprehensive understanding of GG use across settings.² All participants in all case studies provided signed informed consent.

Case 1 is a study with students talking about an exhibition they attended. They interacted in an empty classroom, with two cameras recording them from different

² I initiated the project and completed it with help from students. See the acknowledgements at the end of the article. The project was partly funded by a grant from the Synoptik Foundation.

angles. Three students from a teaching class in qualitative methods participated, and one of them was instructed how to use GG in advance, with a focus on the most basic features, e.g. how to manage the verbal commands (saying “okay glass...”) and swiping the touchpad on the side to go through menus. She was further instructed how to search the Internet and send e-mails and text messages. Co-participants were not told to discuss any specific topics, but the GG user was encouraged to use GG the same way she would have used a smartphone, for example to make searches or look at the time or calendar.

Case 2 also involves students. This was set up in an experimental lab, with four cameras running from different angles. The lab setting was chosen in order to capture all angles regarding bodily movements and sight lines. The researcher was positioned behind a dimmed glass wall and was able to manage the zoom on each camera. Four students participated. They were recruited as friends of one of the students. As in Case 1, one of the students was instructed in GG’s basic features and encouraged to use GG like a smartphone. The students were all instructed to talk about whatever they wanted to as in normal everyday talk-in-interaction. They talked primarily about one of the student’s recent study travels.

Case 3 is quite different from Cases 1 and 2. It is an institutional setting in which participants, who are paramedics, use GG during a simulated emergency in a hospital lab. This event was organised by a large Danish company in order to run a test case with possible implementation perspectives. Two master’s students had the lead on this project, which took place over a four-month period. The aim of this project was primarily to develop apps that paramedics could use in the field. Four apps were developed: a heart massage app, which could help paramedics count heart beats; a medicine box scanner (see Figure 2); an app for calculating medicine for children; and a video-based app for hand-free calling a doctor.

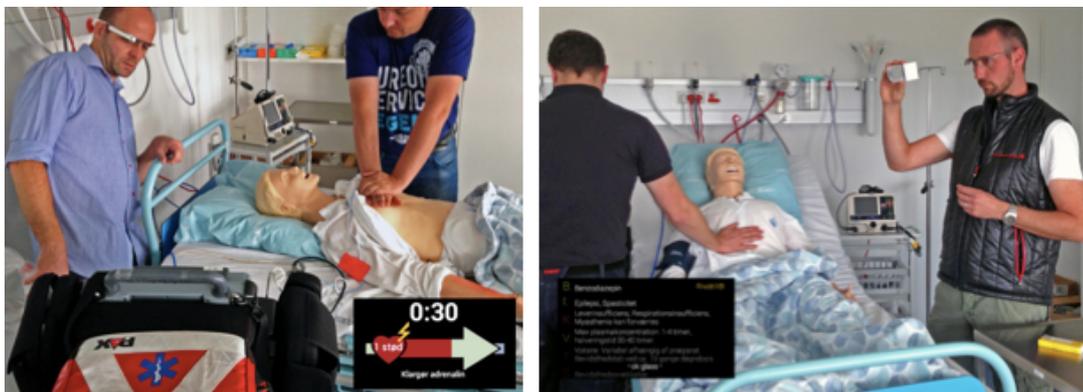


Figure 2. a (left): Paramedics use a heartbeat app. b(right): Paramedics use a medicine box scanner app. Neither of these two photos are anonymised as they are publicly approved and available from Andersen and Andreasen (2014).

In this setting, there are several procedures and types of turn design that the paramedics are supposed to follow, e.g. examining and stabilising the patient (Nielsen, Nielsen, Gravengaard, & Due, 2012). Thus, this kind of situation is somewhat more institutionalised, with some kind of “turn-type preallocation” (Atkinson & Drew, 1979) in which the activities of asking and answering (or responding to) questions are pre-allocated to the roles of being a paramedic (professional) versus being a patient (non-professional). This is also the case regarding preformatted commands to GG as the paramedics are specifically instructed to use the apps but in a somehow natural environment, due to the situation being enacted as in a real-life setting.

Case 4 is use of GG by a farmer in his everyday work life and interactions with cows. The research was conducted with Morten Mathiasen as principal investigator and with the aim of developing apps for registering how much cows have eaten, how old they are, *etc.* The apps were tested during two weeks at the farm. This setting also involves particular tasks and institutional procedures.

Finally, Case 5 is from a retail store, in which different researchers use GG as a video-recording device for interactions and contextual inquiry interviews with customers. Use of smart glasses as video-recording equipment has great potential but will not be further discussed here.

In this article, I focus on three overall issues that emerge from the data across the different contexts. I do not go through each setting but only involve examples from the first three case studies. Epistemics is a key topic as GG both provides (private) knowledge to the user and questions people’s knowledge about the object. The key topics are briefly outlined here, then analytically elaborated upon one at a time.

- **Turn-taking and participation.** GG is voice and gesture managed. Hence an action occupies a turn in the sequential unfolding of talk-in-interaction.
- **Private experience and knowledge.** Glass information on the screen is not socially displayed or publicly available. Only the user knows. Epistemic incongruence.
- **Object orientation and membership categorisation.** Wearing GG prompts accounts about the object (e.g. “What is that thing on your head?”), and users may undertake multimodal identity work and face work. Nobody wants to be a ‘Glasshole’.

4. Turn-taking and participation

The turn-taking system is fundamental to social interaction. Participants respond to relevant actions, for instance in adjacency pairs in which a question makes an answer relevant (Sacks et al., 1974). This occurs not just in turns but also in terms of, for example, object-related and embodied actions in a broader semiotic sense (Kendon, 2005). Actions thus play out normally, in a sequential order, and are suited to the purpose and context. If participants depart from 'normal actions', these deviations are typically accounted for in various ways through types of repair (Schegloff & Sacks, 1973). Social interaction consists of participation frameworks (M. H. Goodwin, 1990) and are contextually configured (C. Goodwin, 2000) at any given moment. People normally orient towards any new or abnormal issues (Garfinkel, 1967) by use of multimodal actions; e.g. shifting gaze or moving around.

This is evident from the data, in which GG use occupies slots in interaction and hence competes and interferes with ongoing social interaction by requiring the same verbal and bodily resources. This involves coordination and leads to the impossibility of progressing the activities simultaneously. This type of activity produces "dual involvements" such as those identified by Raymond and Lerner (2014), as will be discussed later in this article.

The example³ is from the institutional setting (case 3) in which the paramedic uses GG to scan a medicine box. The paramedics are training in a real-life environment in the hospital with a doll as the sick patient. In this situation, the two paramedics are examining and stabilising the patient (doll) while, at the same time, reassuring the "husband" about the situation. Figure 3 shows the participants in the setting.

This analysis aims to show how GG use is socially organised and how multiple activities – including GG use – co-exist and are in conflict due to a transition between human-oriented and non-human (GG) oriented interactions.

³ I have translated the data transcriptions into English. Transcriptions are constructed following the Jeffersonian (2004) standard and with pictures from the video material added in order to capture as much of the rich semiotic environment as possible. Transcription key is found at the end of the article.

Excerpt 1

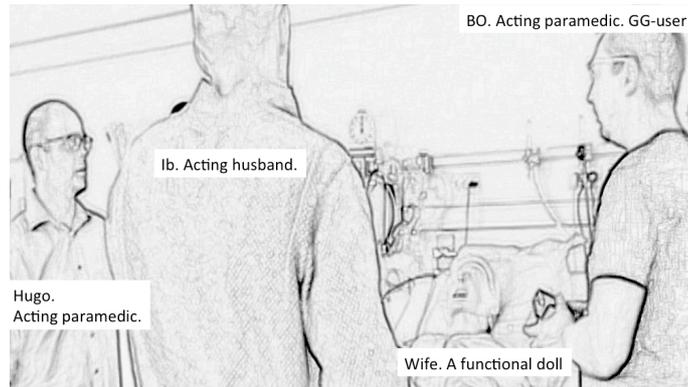


Figure 3. Paramedics enacting a real life situation with a life-size doll with several ‘normal’ human functions, such as ‘breathing’, ‘heartbeat’, and ‘feeling pain’. An incorporated computer and remote control (managed by one of the instructors) operate the doll. This operated doll, which is thus a kind of robot, may also interfere with the human turn-taking system. However, this is not the case in this example.

Gives command. Scans the object, gives command moves the object and gives command again

1 Bo: okay glass (1.1) recognise this (2.6) recognize this

2 Hans: do you write this

3 Tim: yes

((people talking in the background))

4 Bo: .h h. (5.2)

Bo looks in Glass straight ahead then swipes down on the touchpad (cam 1&2)

5 Ib: what do you think [is wrong with her↑]

6 Bo: okay glass (1.1) recognize this (.)

7 Bo: yes bu:t (.) now we just have to look at her (.) right

8 Bo: [then] then we will surely find out↑ (.)]

9 Ib: [yes]

10 Bo: >okay glass<

Scans the object (cam 1 & 2)

Looks in Glass straight ahead

In Lines 1-4, Bo gives a command to GG: “okay glass” (l. 1), then verbally waits silently (1.1 sec) while engaging in several embodied actions: holding the box in front of GG with his left hand, moving it back and forth, gazing at the GG optics/screen. Then another

command is given “recognise this,” a pause (2.6 sec.), and the command again “recognise this” (l. 1). Bo is situated in a rich semiotic ecology of things and people and is momentarily totally engaged in multimodal visible and recognisable actions with two specific objects: GG and the medicine box. In this multiactivity setting, Bo is bodily part of the participation frameworks of situated people, but his attention and orientation is directed at GG.

The long pauses in Line 1 are not projected as transition-relevant places for other people to act since Bo does not orient towards them with his body or through turn design but clearly orient towards GG and the object. The overlap in Lines 2-3 is part of an earlier and completely parallel conversation. The pause in Line 4 is 5.2 seconds, which is long and far beyond the normal one-second standard maximum of silence before it is usually treated as an interactional problem – as registered in mundane interactions (Jefferson, 1983). Hugo, the co-paramedic who stands opposite the patient (doll) lifts and turns his head and gazes towards Bo during the pause (l. 4), indicating by his bodily orientation that he is awaiting something from Bo.

The institutional setting consists of specific procedures (Nielsen et al., 2012) that the paramedic should follow (checking health, blood pressure, etc.), and it is within this context that the paramedic is supposed to do something procedurally relevant – though applied in a novel GG-embedded participation framework. In the verbal pause, Bo stares *robotically* at the prism through which information is projected out in front of his eyes. At the same time, he touches and swipes the touchpad on the side of GG. The semiotic ecology thus consists of multiple activities that Bo uses as resources for handling the task (scanning the box), but the verbal pause is treated by the other co-participant (the ‘husband’ (Ib)) as a place for transition and he takes a turn in Line 5.

Ib does not wait for clear displays that Bo’s interaction with GG is over before beginning his turn, designed as a question to Bo. Nothing in Bo’s orientation, action, or turn design projects Ib’s turn as relevant at this particular sequential moment. However, Ib’s turn is within the specific activity type a relevant question (“what do you think is wrong with her” (l. 5)), which Bo also treats as a relevant question by providing the second pair part (l. 7-8). The interesting analytical question is thus not about overall relevance concerning Ib’s question but rather *why that now?*

Why does the husband take a turn at this particular moment? Looking at the data, it seems clear across settings that GG interaction is interpreted by other participants as less important than verbal interaction. When situated in this specific multiparty and multiactivity setting with people and objects, the human-based turn-taking system seems

to have priority. This is especially true with regards to the silence-machinery. The verbal silence of 5.2 sec. (l. 4) is long and treated as a possible completion point by Ib – *despite* the fact that something else is clearly going on: Bo's embodied orientation towards GG and the medicine box displays in visible and accountable ways that he is occupied with an activity.

If, for instance, Bo had framed or metacommunicated concerning the ongoing GG interaction, Ib would probably have waited for a clearly projected slot before entering the conversation. But we see no clear marker, such as explicit suspension or postponing of the activity, e.g. as otherwise shown by Keisanen et al. (2014) regarding the use of phrases like 'hang on' or 'wait'. It thus seems that although GG interaction is a visible activity and part of ongoing socially shared and oriented-to activities, it remains backgrounded in a hierarchy of activities relevant to the situation. Bo's GG use is, through a recognisable and accountable action, suspended by Ib in Line 5, as he treats the verbal but surely not bodily pause as a transition-relevant place and takes a turn. The consequence is that Bo is suddenly involved in two activities simultaneously: 1) interacting with GG, the non-human participant, and 2) interacting with a human co-participant.

The interaction with GG is not seen as a conversational sequence since GG does not take turns but instead executes a command like a pc or a TV set.⁴ Still, the interactional problem arises since the participants are interacting in the same contextually configured environment with limited semiotic resources: Bo 'needs' to simultaneously allocate verbal and embodied attention to GG and Ib, which produces interference and overlap.

Ib's turn ("what do you think is wrong with her" (l. 5)) is produced while Bo remains *staring robotically*, looking at GG and through GG. But the beginning of Ib's turn is produced after Bo has lowered his arm and the medicine box and raised his right hand again, this time touching GG. Throughout the situation, Bo is performing a multiunit turn, which has no publicly displayed projections of next (human) speaker or possible completion points. Focusing on Bo, the primary activity and projection of the next relevant thing is not towards the co-participants but towards the nonhuman participant (GG). Bo's turn at Line 6 begins when Ib's turn (l. 5) is already well advanced in its production. There thus does not seem to be a competition for the floor in the same conversation but rather an intersection of two different activities, a conversation and the use of GG. Although there is no direct competition for the floor, the two unfolding activities still impact each other's temporal or sequential trajectories.

⁴ I am grateful to an anonymous reviewer for this observation.

Ib's question in Line 5 is responded to by Bo in Line 7. This adjacency pair is appropriately produced within that sequence even though the type of response is barely audible as an aspired answer to the question. But Bo continues simultaneously interacting with GG, which consequently causes overlap with Ib's turn. The sequential trajectories of the relevant actions and commands in response to information provided by GG are foregrounded by Bo, which causes the sudden command in Line 6: "okay glass (1.1) recognise this." This action is clearly not directed towards Ib and is not designed as a second pair part to Ib's question in Line 5 but instead as a command given to GG within *that* computer-mediated non-human sequence. Two sequences thus run parallel between human and non-human participants in the same participation framework, which causes interactional problems. Bo is using different resources to simultaneously carry out various activities, which are coordinated depending on the requirements of the emerging and situated context but with clear limitations regarding available verbal and embodied resources.

This multiactivity setting is thus constituted as a complex form of alternations between activities in which the GG user must switch between activities, priorities, and temporalities, for instance with GG operating on a totally different (slower) time scale than human interaction. Normally, utterances create an interpretive environment that participants use to analyse interaction (Schegloff, 1968). This, however, implies that participants know what is going on and show understanding of the situation through different semiotic resources. When a user is wearing GG (at the moment), co-participants do not seem to know how interaction with GG fits into the coordinated and co-constructed turn-taking system, as shown in the example. Consequently, they cannot identify a relevant next action on a simple turn-by-turn basis, for instance how to treat silence and pauses and how to interpret novel gestures (such as swiping the touchpad or staring robotically).

5. Private experience and knowledge

The capacity for understanding the intentional, goal-directed behaviour of others is a fundamentally interactional process that cannot be detached from the ongoing flow of social activity (Kidwell & Zimmerman, 2007). Participants normally display their understanding of relevant objects, things, issues, *etc.* in the situation at hand (Hindmarsh & Heath, 2000). Research on objects in workplace settings has largely focused on the publicly available design of things such as computers, office items,

screens, etc. (e.g. C. Goodwin & Goodwin, 1996). However, GG is a different kind of object because the information that is accessed during social interaction is not socially displayed or publicly available (as is, for example, a common observable computer screen) but is a *private experience* for the GG user. Similarly, emotions or other kinds of private phenomenological experiences such as, for instance, tasting or feeling are private experiences that can be made public by displaying or producing accounts (Streeck, 1996).

In the following example, from Case 2, the students are talking about one of the student's supervisors. Another student (Tom) is wearing GG and using it for internet searches, video recordings, and a telephone call. In the following example, Tom has asked GG for some information from an internet search, and GG provides information. This affects social interaction because the GG user suddenly takes a turn reading aloud the GG-provided information. However, as this is not comprehensible for the other participants and therefore out of the *in situ* configured participation framework, they continue talking as if nothing happened.

Excerpt 2

Tim and Kim look at Tom, who touches GG with right hand. Pictures at the same time but different angles.

Kim turns his head towards Tim.

Kim and Tim look at Tom. Tom look straight ahead in Glass, aiming at no person

Kim and Tim turn their heads towards each other. Smiling. Kim lifts his index finger

1. Tim: who is your supervisor
2. Kim: my: supervisor↑
3. Tim: mm
4. Kim: oh: who it is↑
5. (0.9)
6. i:t i: :s'
7. Tom: bi folded glasses (0.7)
8. NO that was not what i wanted (.) well
9. Kim: ^ i: ts one' eh^ its one from here fro' >no from diku< >yes from diku<

The students are discussing who one of the students (Kim) will have as supervisor for

his master's project. In Line 2, Kim accounts for the question (l. 1) by making a question marked formulation: "my_ supervisor↑," which Tim, who asked him, confirms through a minimal response (l. 3). Kim then produces a change of state token ("oh" (l. 4)), indicating that he now understands, that he is supposed to answer the question by providing the name of the supervisor. However, before trying to answer the question (l. 9), the GG user interrupts the ongoing conversation (l. 7-8).

The four participants are contextually configured in a F-formation, in which a mutual orientation is possible (Kendon, 1990). But Tom the GG user is throughout the conversation simultaneously part of the embodied participation framework only in a disconnected manner due to his orientation towards multiple activities: He is simultaneously part of social interaction and non-human GG-interaction. The other participants are engaged in the collaboratively coordinated and co-constructed conversation while continuously scanning the local environment for relevant next actions (cf. Ciolek & Kendon, 1980), especially regarding orientation towards the GG user and the ways in which he is simultaneously part of the F-formation but also departed from it and engaged in completely different activities. This is, for instance, evident in the way in which the others momentarily gaze at Tom, as shown in the first picture in the transcript, where they orient towards Tom. This visual orientation is, at this moment, not produced in response to any verbal conduct but instead in response to the GG user's ongoing embodied actions, specifically his gestures and touching of the GG with his right hand. This indicates the participant's recognisable and accountable ways of producing involvement in more than one course of action. The difference between dominant communication and subordinated communication, as Goffman identified in his discussion of footing (1979), is evident in this example. I shall discuss this in terms of epistemic asymmetries.

In Lines 5-6, there is a pause and production of self-initiated repair indicators (i:t i::s) as Kim seeks the supervisor's name. During this word search and hence possible transition slot, Tom self-selects and takes a turn, which causes minimal overlap (l. 6-7). The co-participants gaze at Tom but seems to interpret his talk in Lines 7-8 as a response to private and unknowable GG interaction. Before Tom's closing "well" (l. 8), Kim starts producing the second pair part in Line 9, which is interpretable as a candidate answer to Tim's initial question about the supervisor's identity. Kim thereby treats Tom's actions as out of context and hence not with any kind of projected next speaker or next relevant action.

Tom's turn is a response to GG information: First he reads aloud the information provided to him by GG: "bifoldded glasses" (l. 7). This is recognisable through his robotic stare and moving pupils. Then he assesses the information as incorrect with a high volume start: "NO that was not what i wanted" (l. 8). He thereby also accounts for the type of action he is producing: i.e., that this is a response from GG read aloud and that this information was not what he had requested, thereby indicating that he had requested something else instead and thus that he has given a command to GG prior to this sequence. Just as the ringing of a telephone summons the call receiver and hence serves as a first pair part (Schegloff, 1986), the GG-provided information may thus be seen as a first pair part that makes a response from the GG user relevant as a second pair part. In this case, Tom chooses to read the information aloud, which consequently interferes with the conversation.

Tom's actions are displayed in social interaction and occupy interactional space, but they are directed at the non-human participant (GG), which provides him with information that is totally private and displayed for him alone. As Haddington et al. (2014, p. 24) summarise, participants may be interrupted, engaged, disengaged, stopped, paused, and their actions suspended or postponed during multiactivity sequences, which seems to be the case in this example, in which co-participants stop while Tom takes a turn.

Usually, however, the different activities within the same setting are comprehensible for participants. This is not the case in this example. It is apparently difficult for Tim and Kim to understand the relevance of Tom's utterance since they have no knowledge of the information provided to the user by GG. Consequently, they continue their talk about the supervisor, thereby treating Tom's actions as out of context and irrelevant for the ongoing discussion. GG thereby seems to involve private knowledge and produce side effects with completely different involvements. This is sequentially problematic for the co-participants' conversation as the private GG knowledge and topic are drawn into the social organisation.

This analysis has shown that information on GG is private and thus only for the GG user, who then possesses particular epistemic rights and possibilities. It has also shown that information on GG may be out of context, that GG draws attention, and that side-sequences occur. It has been shown that co-participants need to interrupt their interaction in order to make sense of actions performed by the GG user and understand whether or not the GG user's actions are part of their conversation. Their interpretation of the GG user-produced actions depend on interactionally recognisable cues (cf.

Keating & Sunakawa, 2010) such as gaze (robotic staring), gestures, and touching of GG as well as the sequentially relevant meaning of the utterance.

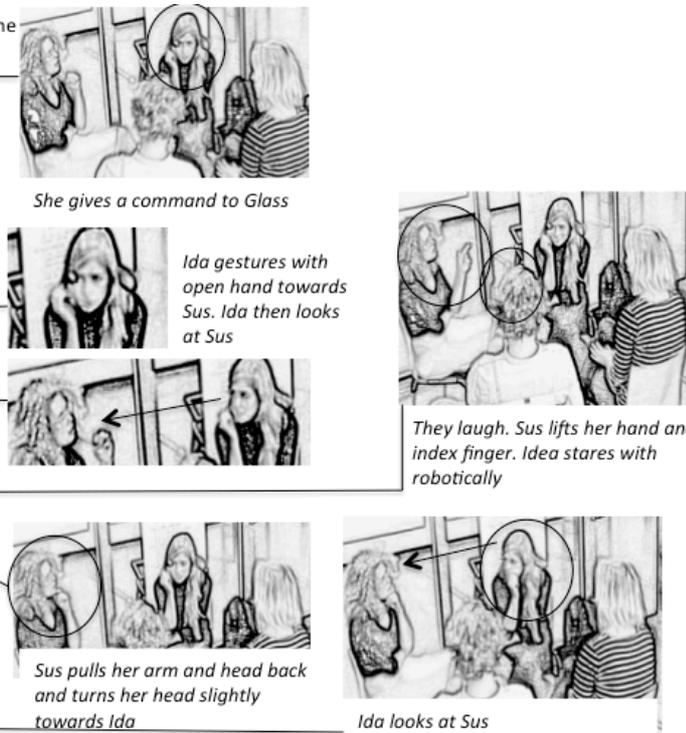
6. Object orientation and membership categorisation

GG use also concerns identity and establishing different categories and positions in interaction (Sacks, 1989; Zimmerman, 1998). The term *Glasshole* emerged after GG had been on the market for a while, and users (in Silicon Valley area) had worn it in various public places (Due, 2014a). This has a lot to do with the GG information being a private experience in an epistemic asymmetric configuration and the production of overlap between different activities. This also has consequences for the GG user's position in the embodied participation framework and for the user's own identity work.

The following example is from Case 1, with students talking about an exhibition they went to. The students were instructed to discuss whatever they liked, and the topic was thus their own. Furthermore, the GG user was simply instructed to be a conversation-partner, with no predefined procedures that she needed to follow, merely to act naturally while at the same time using GG as she would use a smartphone to, for example, search the internet for relevant information. In the example, the GG user apparently tries to navigate between the primary social interaction sequence and a non-human side sequence as main and subordinated communication. The analysis shows how the user seeks to reduce the intrusiveness and interference structure of the GG-provided information by invoking a range of interactional resources.

In the beginning of the example, the students are talking about the exhibition and about a book from the exhibition that Liv took home with her (l. 19). Then, in Line 23, Sus makes a minor topic shift and starts talking about the "S M K Friday," which is another exhibition. Ida then gives a command to GG ("OKAY GLASS" (l. 24)) in partial overlap with Sus' utterance. Ida's embodied action is clearly oriented towards GG: She is leaning forward, staring robotically, and swiping the touchpad while designing the turn in a loud and very clear volume. However, as was also shown in the previous example, it is not possible to actually produce a verbal sound response to a non-human side sequence without interfering with the social interaction in the locally organised participation framework.

Excerpt 3

<p>19. Liv [°it is such a eh°] i took one with me home</p> <p>20. Sus [°eh whats it ca:lled°]</p> <p>21. DID YOU</p> <p>22. Liv mm</p> <p>23. Sus there is this S M K friday</p> <p>24. Ida OKAY GLASS (.)</p> <p>25. °oh sorry°</p> <p>26. (1.1)</p> <p>27. Sus no (.) but i dont know about that'</p> <p>28. Kim hehe haha hehe hehe</p> <p>29. but one can study some thing↓</p> <p>30. Ida >TAKE A NOTE<</p> <p>31. >°yes what do you say°<</p>	 <p><i>She gives a command to Glass</i></p> <p><i>Ida gestures with open hand towards Sus. Ida then looks at Sus</i></p> <p><i>They laugh. Sus lifts her hand and index finger. Idea stares with robotically</i></p> <p><i>Sus pulls her arm and head back and turns her head slightly towards Ida</i></p> <p><i>Ida looks at Sus</i></p>
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This interference with social interaction and the relevant sequential order of things is one of the issues with being a *Glasshole*, which can now be more precisely defined as *to breach some of the normal rules of interaction by using smart glass technology*. It is, of course, first of all members problem, which may be seen in how Ida, the GG user, tries to manage transitioning in and out of the different sequences. She is ‘supposed’ to be a regular conversational partner and at the same time use GG for relevant tasks (such as seeking information) during the discussion. Giving the “okay glass” command to GG is an opening sequence that activates GG and thus prompts further commands concerning what GG should do. Immediately after the command (l. 24), the co-participants turn their gazes and bodily orientations towards Ida, but before anyone has the chance to initiate repair, Ida herself accounts for the overlap with a smiling excuse, designed as a self-initiated repair: “oh sorry” (l. 25). This repair is recognisable as sequentially related to her interfering command to GG, produced in overlap with Sus’ talk. This post-produced repair displays a stance-taking and hence management of the ongoing dual involvements.

Action and stance in interaction may be seen as representations of emotions and inner states (C. Goodwin & Goodwin, 2000; M.H. Goodwin, Cekaite, Goodwin, & Tulbert,

2011), and in this case, Ida's account may be interpreted as part of her emotional stance: She may feel that it is inappropriate to produce the overlap and thus 'needs to' account for it. The "sorry" account may be interpreted as indicative of an inner conflict between different identities: one on the transportable and situational level as a 'person-who-Doesn't-Interrupt' (DI) and the other on the discursive level as a 'person-who-Cares-more-About-her-Device-than-co-participants' (CAD) (cf. Zimmerman, 1998). Of course, these membership categories are interpretations (for similar constructions see Psathas, 1999; Mondada, 2009), but they are grounded in the fact that Ida accounts for her interruption with an explicit apology, thereby displaying that her prior action is sanctionable and that this projects a 'need' to repair the interruption.

Throughout the example, Ida undertakes this kind of identity work while switching between the activities. Each membership category has its own relevant category-bound activities: related to the DI are activities such as being a normal morally obligated person conversing in accordance with the normal turn-taking machinery. In contrast, related to the CAD are activities such as giving commands to GG in the trajectories of relevant GG-directed commands. The clash between activities may thus also be a clash between the GG user's different discursive identities.

There is a 1.1 sec. pause (l. 26) after the "sorry" account, which is interpretable as a trouble source. Just before completing the "sorry" account, Ida simultaneously opens her hand and briefly gestures towards Sus (l. 25), as if bodily projecting the sorry and the floor towards Sus. During the pause (l. 26), Ida turns her head towards Sus, and they have what seems to be eye contact for a short period, before Sus continues her talk, and Ida turns back and stares robotically (l. 27). Then, in Line 30, another command to GG is given as a part of the command structure. After 'waking' GG with the initial command "okay glass," the user must give a specific task to GG. Ida gives the command quickly and at a high volume: ">TAKE A NOTE<" (l. 30)). This subordinated side sequence is again produced in overlap with Sus' unfolding talk.

Sus responds to the overlap with embodied withdrawal: She leans back, pulls her arm back towards her mouth, and turns her head. Sus withdraws from the interaction with her whole body and thus constructs a shift in the contextual configuration from being a speaker to being an audience. As a consequence of the dual involvements, Sus is suspending the GG user by bodily disengaging from her.

Similar types of 'adjusting actions' in multiactivity settings have been analysed by Raymond and Lerner (2014) but with a focus on an individual's own practices. In this example, two types of suspending adjusting actions may be seen to work in parallel: 1)

the GG user mitigates her intrusive actions through high-speed design, repair, and allocation of the floor back to Sus: ">yes what do you say<" (l. 32), which is multimodally packaged with an embodied orientation and a turn-projectional gaze, and 2) the co-participant withdraws from the fight over the floor.

At no time in my data do participants verbally express dissatisfaction or otherwise produce explicit sanctionable accounts concerning the GG use. But misaligned response is still recognisable through turn design and embodied orientation, which builds an interactional history of trajectories in which GG use becomes a dispreferred activity – or at least makes repairs such as "sorry" and embodied alignment relevant.

It is thus almost as if Ida, the GG user, is producing footings for herself whereby she tries to inhabit the GG membership category while at the same time stepping out of this membership category. She is the animator who undertakes GG-related actions and produces the 'necessary' non-human side sequences (e.g. commands). But through these actions and their turn design, she also distances herself from that discourse identity, thereby indicating that she really is neither the author nor the principal behind these actions (Goffman, 1979). She is rejecting her own produced discourse identity – most likely because she does not wish to be the rude *Glasshole*.

7. Norms, behaviour, and socialisation

The management of intersecting courses of action poses options and opportunities for the GG user to employ different embodied practices in order to manage the multiple activities. However, in none of the examples in this analysis was this management (through the use of various semiotic resources) unproblematic. Adjusting actions within this setting of dominant conversational sequences and subordinated non-human side sequences are recognisable moves, and both the GG user and co-participants use different to manage the multiple activities. The analysis has shown how participants seek to manage these complex, multilayered, and intertwining activities in different ways. Deppermann's (2014) distinction between 'intra-personal' and 'inter-personal' foci is thus also relevant to this analysis in order to demonstrate the difference between one individual (intra-personal) engaged in multiple activities and using different modalities at the same time from how multiple activities are coordinated and accomplished collaboratively (inter-personal). Although several of the participants in the examples can and do adjust their actions, it is mainly the GG user who somehow is responsible for managing the accountable and recognisable production of the different activities.

However, other co-participants orient and adjust to the multiple constraints, thereby collaboratively contributing to it.

Overall, this article has addressed three interrelated phenomena: how GG interferes with the turn-taking system; how GG interferes with epistemics; and how GG interferes with discourse identities. Many other smart objects – such as other smart glasses, smart watches, or smart accessories (for example, different sorts of smart jewellery) – will in the future touch upon the same issues regarding turn-taking, knowledge, and identity, and it will be important to think about how to design relevant interactions with these kinds of objects. Such interaction must fit into the organisation of social interactions and already-established ways of managing necessary or unavoidable multiple activities – for instance, experiences from studying interactions in service encounters (Ticca, 2014) – so as to avoid amplification of the term Glasshole or the invention of new similar terms.

Today, there is a bias towards designing these smart objects without considering the detailed organisation of social interaction. There is a huge difference between using GG when working (e.g. being a doctor, policeman, farmer, or production worker), exercising (e.g. running, cycling), *etc.* on one's own compared with using it in social settings, as described in this article. The use and functionalities of GG interfere with social interaction on many levels, which is part of the big media story about rude *Glassholes*.

Many of the social implications of using GG derive from its use of voice and gesture control and hence visible and audible actions in social interaction. This also implies that there is no common or shared practice for how to behave in response to this kind of GG use. This is, of course, unsurprising since the technology is very new to people, and behavioural systems and social scripts often lag behind the launch of new products and technologies (Schank & Abelson, 1977; Norman, 1983). However, this is also a question of the user's knowledge and practical experience with the technology as well as the co-participant's use of GG and practical experience interacting with GG users. That is, the implications of using GG in social interaction are partly relative to the participants' expertise and epistemic stance towards the technology.

Nonetheless, this is a first prototype version of a completely new product category, and other products as well as new GG versions will be launched alongside the continuous development of new and even smaller and cheaper technologies. New similar smartglass products – such as Microsoft's HoloLens and Osterhout R8 – seem to be developed with a single user in mind. The software engineers are engaged with developing efficient products with relevant interfaces. But as this article has shown, it is

also important to incorporate understandings of the intricacies and complexities of social interaction, in which most of the products will eventually be used in one way or another.

The detailed organisation of turns, the use of knowledge, and relevant and attractive membership categories are always important in social interaction (Sacks, 1992), and it is unlikely that many people will use smart glasses before these issues are solved.

8. Designing smart objects that fit into social interaction

Today, the various functions of smart glasses are ambiguous to most participants, which is observable, for example, in the form of hesitation and repair initiations in social interaction as well as non-uptake of GG-provided information. As Starner (1999) noticed, the affordances of portable devices in the past helped constrain their perceived use. As opposed, for instance, to the use of a smartphone, which is almost always observable in interaction, the use of GG is a less certain activity. With GG, there are no general observable cues or markers for activity and even fewer markers for specific activities. Co-participants may see that the GG user is staring robotically; may see the small lighting dot in the glass; may see how the GG user is disengaged, entering and existing the dominant conversation; and may see that the GG user deploys specific gestures. But it is difficult for co-participants to interpret the meanings of these actions and to project when the GG user is interacting with them or with GG. The production of participation cues may need to be taken into consideration when proceeding with technological development.

GG possesses numerous functionalities: checking e-mails, taking photos, recording videos, searching the Internet, playing games, and using other kinds of apps such as a heartbeat counter or a medicine box scanner. However, none of these various activities are transparently displayable in social contexts. When participants are using smartphones, their co-participants may have an inkling of what is going on since they can see the display or know the context, and when participants are showing each other pictures on a digital camera, the object is knowable (Aaltonen, Arminen, & Raudaskoski, 2014). This is not the case with GG as the screen is extremely private: small and close to the eye. The experience and understanding of the situation is thus private. Co-participants may have no idea how the device is being used here-and-now and whether or not the user is interruptible or a relevant/irrelevant participant in interaction. This is, as has been shown, a complicated matter in social interaction.

For the time being, with the present technology, it seems that information cannot be provided fast enough to be presented at specific, relevant times in interaction, which inevitably means that almost every kind of GG-provided information occurs out of sequential context, thereby producing the different overlaps, as shown throughout the analysis. Miller (1968) proposed a 'rule' for *micro-interactions* with technology. Micro-interactions are "interfaces that provide a maximum amount of utility for the minimum amount of user attention" (Starner, 2013b, p. 15). For instance, instead of going through ten commands, a micro-interaction may only take two. The rule involves a maximum of two to four seconds of waiting time before an action or piece of information is provided (Miller, 1968; Oulasvirta, Tamminen, Roto, & Kuorelahti, 2005). But this rule needs to be re-thought because it has mainly been investigated from a computer perspective (Ashbrook, 2010, p. 8).

Micro-interactions are desirable because they may minimise interruption. However, two to four seconds may be a long time to wait for interaction with a computer, when participants are already engaged in other activities. As shown, participants are, on one hand, uncertain about how and when to respond in relation to GG-based interactions and, on the other hand, are not just waiting in silence for the GG user to return to the conversation with a relevant turn. Instead, co-participants move on in the interaction, making GG interactions appear out of context and as inappropriate overlaps. Providing information for the here-and-now conversation must ideally be in real time or at least within the Jeffersonian maximum of one second's pause in interaction.

Dual involvements are, of course, possible, as shown in various settings (see overview in Raymond & Lerner, 2014, p. 242), but these depend on the capacity or expertise of participants, the affordances of the technology within the range of possible available semiotic resources, and the development of new cultural norms concerning how to be socially engaged in multiple activities with wearables.

9. Technological ways of conducting ourselves in and towards the world

It is observable from the data presented in this article and the large data pool behind the research project that technological innovations like smart glasses do not simply reproduce existing orders, norms, and understandings regarding, for example, turn-taking, knowledge, and identity. The technology also reconfigures the norms by creating new multiactivity settings, and emerging contexts in which separate activities begin to compete and interfere with each other by requiring some of the same verbal, bodily,

sensory, and spatial resources. Coordination and management are key tasks for securing progressivity in these situations.

Today, a smart object like GG still largely needs to be managed and given commands, but the 'techno-dream' of big tech-companies like Google is to make the computer processes truly 'intelligent' so that they automatically can read into our lives (for instance, through our internet and digital profiles and through sensor technology) and, on this basis, perform the actions, we 'want' to do before we do them. For example, the distribution of morality to the smart object and the dream of the invisible computer, peripheral computer processes, transhumanism (Farrell & Hart, 2012), and cyborgs with enhanced abilities are (of course) potentially ethically complex, but (perhaps) equally importantly, this 'techno-dream' completely lacks understanding of the social complexities and everyday organisation of turns-at-talk.

Following Heidegger (1977), I do not suggest that technology such as GG is a radically new thing, as the object and our relationship with it is already an outcome of a technological way of seeing and conducting ourselves in and towards the world. As humans 'in-the-world' we are already experts at going about everyday life, at dealing with the subtleties of every particular situation. That is why everyday life seems so obvious. However, as this article has shown, this always-already-thrown into a technological world does not prompt easy understandings of new technology in multiactivity settings, yet does affect the very basic organisation of interactions. Therefore, this article also opens up for a new post-Heideggerian discussion concerning the needs that this kind of technology fulfils. Such a discussion is necessary if we are to secure future situations in which nobody will need to be called a Glasshole.

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