The many minds problem: disclosure in dyadic versus group conversation

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What causes people to disclose their preferences or withhold them? Declare their love for each other or keep it a secret? Gossip with a coworker or bite one's tongue? We argue that to understand disclosure, we need to understand a critical and often overlooked aspect of human conversation: group size. Increasing the number of people in a conversation creates systematic challenges for speakers and listeners, a phenomenon we call the *many minds problem*. Here, we review the substantial implications that group size is likely to have on how much people disclose, what they disclose, and how they feel about it.

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Introduction

Comparing dyadic conversations to group conversations may seem like a matter of simple addition, like the difference between a bicycle and a tricycle — just add wheels. In this review, however, we suggest that comparing dyadic and group conversations is more like comparing bicycles to cars: yes, one has more wheels, but they are also utterly different means of propulsion, governed by different mechanical principles and different rules of the road, which ultimately create vastly different experiences for the person behind the wheel. Group and dyadic conversations are so different, in fact, that we suggest they should be considered categorically different activities.

Specifically, we argue that conversation in groups larger than two people creates a *many minds problem*. Drawing on insights from conversation research, we provide evidence that the addition of more minds fundamentally alters the basic mechanics of conversation, such as the pattern of turn-taking, the balance of floor-time, and the nature of the feedback that listeners provide. This makes an already difficult coordination problem even more complex, while increasing the risk of failure. Ultimately, the differences between dyadic and group conversations have implications for the disclosure process, including how much people disclose, what they disclose, and how they feel about it.

The mechanics of dyadic versus group conversation

The consequences of the many minds problem emerge in three fundamental mechanics of conversation: airtime, turn-taking, and back channel feedback. *Airtime*, the main currency of conversation, is how long a speaker holds the floor to say what she wants to say. Generally, only one person speaks at a time, so conversations use a system of *turn-taking* to allocate airtime without speakers interrupting each other. When they are not speaking, conversation participants use *back channel feedback* — a stream of head nods, "uh huh"s, and "yeah"s — to signal their responsiveness to the person holding the floor. The many minds problem impacts each of these three basic features of conversation: more minds reduces the airtime available to each person, makes turn-taking increasingly intractable, and dampens and ambiguates back channel feedback.

Less airtime per person

One of the hallmarks of conversation is that only one person speaks at a time. As group size increases, there is less and less airtime available to each individual, which has two consequences. The first is obvious: each person tends to speak less frequently, and the duration of each turn in the conversation tends to be shorter [1]. In addition, airtime becomes particularly scarce because group members do not split it equitably. Instead, as groups become larger, fewer people claim a larger proportion of the available airtime [2–5], with evidence that individual-level factors like trait dominance [6] and group-level factors like gender composition [7] play a role in the ultimate allocation of speaking time.

A second consequence of less airtime per person is that people have more time to listen. Indeed, as groups get large, their conversations often unfold as sequences of exchanges between two people, with the rest of the group as bystanders [8,9]. Group conversations may therefore be less like a collection of people all talking to each other,

and more like pairs of people conversing in front of an audience. If this phenomenon is borne out in future research, it may lead to several psychologically rich consequences that have yet to be explored. For example, we suspect that being part of the audience — rather than being the primary speaker or the primary addressee — has a range of psychological effects, such as increased feelings of exclusion, increased mind-wandering, or in some circumstances, more time to critically examine what is being said.

More-complex turn-taking

In an ideal conversation, speakers neither talk over each other nor have too much silence between turns. To solve this coordination challenge, humans naturally adopt an orderly system of turn-taking that is remarkably consistent across languages and cultures [10]. Despite the fundamental importance of turn-taking, researchers are still working out the details of how speakers cede the floor and how listeners know when their turn is approaching (e. g. cues like eye gaze, head orientation, prosody, etc.) [11[•] ,12–14].

Even less is known about how the dynamics of turn-taking vary with group size, although it is clear that adding more minds adds pressure to the turn-taking system. Dyadic turn-taking is simple: one person speaks, then the other person speaks. But in a larger conversation, it is less clear who should speak next. Often, the current speaker selects the next speaker using eye gaze [15,16]. But who should the speaker pick: the person who has spoken least recently, the person who has something relevant to say, or someone else? Speakers must make these decisions on the fly, and their choices may affirm or offend others in the group. Meanwhile, listeners may have to jockey with each other for the floor, or they may have a turn thrust upon them with little warning. Importantly, these complexities — many of which are opportunities for future research — do not arise in dyadic conversation, but they are inherent in group conversation.

As groups get very large, research suggests that increased turn-taking complexity has at least two possible outcomes: either large groups will fracture into smaller subgroups and talk amongst themselves, or large groups will manage to preserve a centralized conversation, but at the expense of some of the characteristic features of conversation [17,18[•],19,20]. For example, many group interactions are forced to adopt formal methods of allocating turns (e.g. Refs. [21,22]), such as hand-raising, deferring to an agenda, or giving a chairperson control of the floor.

Less listener feedback

Listeners in a conversation are not just speakers in waiting. Rather, they are actively involved in providing feedback to speakers about how the communication is going. Back channels — nods and short utterances like 'yeah,' and 'uh-huh,' — might seem like conversational filler, but they are surprisingly important and play a vital role in speakers' ability to communicate clearly. For example, when listeners fail to supply feedback at the narrative climax of a story, speakers often struggle to bring that story to a satisfying close [23,24].

One might expect speakers in groups to receive more feedback because there are more listeners to provide it, but there is suggestive evidence that back channel feedback might actually decrease as group size increases [2,25–27]. Research has not yet uncovered why this decrease in feedback might occur. We suspect it may be due to a diffusion of responsibility: in dyadic conversation, whoever is listening has sole responsibility to provide feedback, but listeners in groups can socially loaf and rely on other listeners to pay attention and provide feedback. This might be why people who are attentive listeners in one-on-one conversations can often become blank-faced as groups get larger (e.g. think of a large group meeting where people might be listening, but one wouldn't always know it from their faces). Moreover, increasing group size makes it more likely that listeners' feedback will conflict. For example, one listener might be visibly engaged while another is deeply confused, and responding to one listener might mean ignoring or offending another [28]. Overall, there is a lack of empirical research on how group size affects the dynamics of back channeling and related phenomena such as nonverbal synchrony, active listening, responsiveness, and rapport [29–31].

In sum, the basic mechanics of conversation change considerably between dyads and groups, as a result of what we call the *many minds problem*. The addition of more minds means each conversant spends less time speaking and more time listening. Dyads allocate turns spontaneously and effortlessly, while groups do so with more complexity, frustration, and even formality if necessary. Additionally, as group size increases, it is possible that the quantity and quality of back channel feedback decrease. While these differences have implications for many aspects of social interaction, they are likely to be especially important for disclosure.

Implications for disclosure

Speakers in group conversations have more minds to coordinate with — and more minds to judge them if something goes wrong. Moreover, more minds means less airtime for any one person to make himself understood, more complex and uncertain rules about turn-taking, and less listener feedback. These elements of the many minds problem likely have significant implications for disclosure, including how people judge the risks of disclosure, the content they choose to share, and whether they speak up at all.

Disclosure risk

Disclosing information is socially risky, especially when the information is intimate. For disclosure to happen, then, people must weigh both the possible benefits of disclosure, such as interpersonal liking and relational intimacy [32–35] against the potential risks, such as social rejection, leaving a poor impression, and embarrassing one's conversation partner [36,37].

We suspect that the many minds problem alters this risk calculus. The more people who are engaged in the conversation, the less likely it is that a speaker will articulate her thoughts in a way that is clear to everyone [38]. Moreover, speakers in groups have to negotiate many different relationships, and certain topics of disclosure may be too intimate for one relationship while not being intimate enough for another; or a topic that would be appropriate to discuss with each of three listeners as individuals may be inappropriate to discuss with them as a group. Speakers may also be hamstrung by competing goals with different listeners (e.g. flirt with him, look smart in front of her, etc.) [39,40]. Lastly, in group conversations, there are simply more people to judge speakers if something goes wrong while navigating all of these challenges.

Adding more minds may also affect perceptions of social risk by changing the underlying conversational mechanics. For example, *less airtime* means speakers have limited opportunity to correct bad impressions that might arise during disclosure; *less listener feedback* likely means that speakers feel less supported when disclosing to groups; and *more-complex turn-taking* means that listeners themselves might resort to silence and not jump in as eagerly with their own reciprocal disclosure — a critical feature of the disclosure process [41,42]. This should sound familiar to anyone who has been involved in a group conversation, and rather than carefully listening, found themselves worrying about what they just said, planning what to say next, or wondering if the time is right to share their own self-disclosure. The relationship between group size and perceptions of social risk is currently underexplored, and all of these possibilities provide fruitful areas for further research.

Disclosure content

If the many minds problem does indeed lead to greater perceived social risk, this in turn likely focuses speakers more on self-presentation. Indeed, people try harder to present themselves positively as group size increases, using fewer negative words [43•], laughing and smiling more [44], and providing less constructive criticism [45]. When self-presentation concerns are high, sometimes the best option is to not speak at all, and research supports the possibility that some people opt to stay quiet rather than risk higher self-presentational stakes [46•,47]. This shift towards self-presentation and silence is the very opposite

of what is required for disclosure, which is a willingness to reveal potentially sensitive information. Altogether, the many minds problem and its consequences suggest decreased disclosure in group conversations.

Disclosure amount

This prediction is borne out by a handful of studies that have directly investigated how self-disclosure varies with group size. The results suggest that people are less willing to disclose personal information to larger groups [48,49,50•,51•], and especially less willing to disclose highly intimate information as group size increases ([52]; see also Ref. [53]; and [46•]). While this early work supports our predictions, these studies were not highly powered and more research is needed to replicate these findings and to understand the causal mechanisms.

Implications for ongoing research related to disclosure

So far, we have highlighted how the addition of more minds may change the fundamental structure, process, and experience of a conversation, and identified possible consequences for the risks of disclosure, the content of what people disclose, and the amount they choose to share. The many minds problem also has implications for several emerging areas of research related to social interaction and disclosure: people's fears about disclosure, the disclosure mistakes they make, and the disclosure strategies they employ.

Disclosure fears

An emerging line of work largely finds that people's beliefs about disclosure in conversations can be remarkably pessimistic. People hold overly gloomy views about the prospect of talking to a stranger [54], and this pessimism extends to people's beliefs about how much their conversation partners like them after a disclosure-filled conversation [55]. People are similarly pessimistic about the benefits of providing honest feedback [56], and even disclosing gratitude [57]. Again, this research has not varied group size systematically, but because many of these phenomena are rooted in perceptions of social risk, we suspect they may be exacerbated in groups.

Disclosure errors

Conversation is often used to transmit novel information. Speakers, however, don't always supply all the necessary background information to make their communication clear [58,59], which can lead to misunderstandings and unsatisfying interactions. For example, speakers choose to talk about uncommon experiences and tell listeners novel stories, when in fact listeners would rather hear about common experiences and familiar stories instead — because they are easier to understand [60,61]. One unforeseen risk of disclosure, then, is failing to communicate one's experience in a way that resonates with one's listeners. Because group conversation increases this

perspective-taking burden, the many minds problem may increase the frequency of these errors.

Disclosure strategies

Recent research has identified a robust repertoire of disclosure strategies that people can deploy to improve their conversational performance. For example, people can make jokes to appear confident and competent, reveal personal failures to assuage envy, palter to avoid telling outright lies, switch topics more frequently to increase conversational enjoyment, or label their emotions to convey a more positive impression [62–65]; Yeomans and Brooks, working). Individuals can also use clever strategies like asking more questions, especially follow-up questions, to get *others* to disclose, while making themselves look more responsive [66]. There are also disclosure strategies that people *could* use, if they were better understood. For example, people think that asking for advice reveals their ignorance, when in fact it makes them look more competent [67].

While these strategies have been investigated in dyadic contexts, many questions remain about how they operate in groups. For example, do people use these strategies *more* in groups because they are more focused on self-presentation, or *less* because larger groups increase the cost of failure? Similarly, the consequences of these strategies may differ in groups: their benefits may be amplified because there are more people to impress, or they may backfire because speakers receive poorer feedback about whether they are executing these strategies successfully.

Conclusion

If we trained a machine (are you listening, Alexa?) on only dyadic conversations, how would it perform in groups? We suspect that it would struggle substantially. Fortunately, most humans have been trained in both dyads and groups, and it is remarkable how fluidly people move between them. In everyday life, single dates become double dates, drinks with a colleague becomes drinks with the whole team, and two people casually tell another friend to pull up a chair. In short, people are well practiced in moving between conversations of varying sizes, but the casualness with which people move between dyads and groups can obscure the gulf that lies between them.

Introducing more than two minds into a conversation can change its nature considerably, which we have called the *many minds problem*. Specifically, we have argued that additional minds make coordination more difficult, while increasing the social risk of failure. Mechanically, conversants have less airtime to make themselves understood, while dealing with more complex turn-taking and less listener feedback. These differences have important consequences for how people disclose, what they disclose, and how they feel about it — consequences that research has yet to fully explore.

The essence of our social lives is the words we say to each other: the secrets we confide, the jokes we share, the vacation stories we endure. Considerable research has uncovered the psychology underlying what we say and the effects it has on us and the people who listen. But only a small portion of this research has systematically considered a simple, but critical, factor that transforms the experience of saying something: how many people are listening.

Conflict of interest statement
Nothing declared.

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