Agile Team Size and the Ringelmann Effect

Teams influence individual performance in many ways.

In a previous post, we talked about the Köhler effect - the impact of having team members with lesser skills working with stronger teammates to improve performance. In this case, being a part of a team is providing a positive influence.

Another potential dynamic may be affecting your team performance but with negative influence – when the overall size of the team grows too large the Ringelmann effect may set in.

The Ringelmann effect occurs when individual performance begins to diminish as the size of the team increases. This phenomena can also be known as "social loafing."

While one would think this would occur because of the additional coordination necessary for a larger group, it is believed to originate because one or more members of the team are lacking in motivation. We have all seen the effects of the Ringelmann effect from time to time. While not usually expressed orally, a team member is thinking, "Someone else will work a little harder so I don't need to" or "No one will notice if I don't put in 100% today."

Teams, and especially Agile teams, cannot tolerate this type of behavior for very long so keeping our teams small and self-accountable is important.

Here are a couple of tips for how you can overcome the Ringlemann effect and keep your teams fluid and lean:

Establish your ideal team size. Many organizations use the "two pizza" rule for building teams. A team should never need more than two pizzas to feed them. So somewhere between 5 to 9 people feels about right, depending on team appetite of course. The Scrum Guide states a team should be no larger than 9 people so if you start to hit double-digits, you are probably too big.

Intentionally monitor team size. If you have multiple teams, use a dashboard to keep track of how your team size is changing. Here is an example I have used. Team size will often creep up over time unless you are intentional about it.

Keep them motivated. Regardless of team size but especially with larger teams, work with the product owner to make sure the team has a compelling vision to work towards. Obviously, any team without a vision will have issues but a large team without a vision will slowly begin to rot.

Learn what an effective team "sounds" like. A well-functioning team has an energy about it. It's a natural buzz of energy, engagement, and potential. A little like the hum of electrical wires. You can't always see it but you know the power is there. If the team begins to grow quieter than usual, they may be under the influence of the Ringelmann effect or perhaps another dysfunction of a team

http://cream.hr/blog/the-fragility-of-culture/

The Fragility of Culture

Cream.HR

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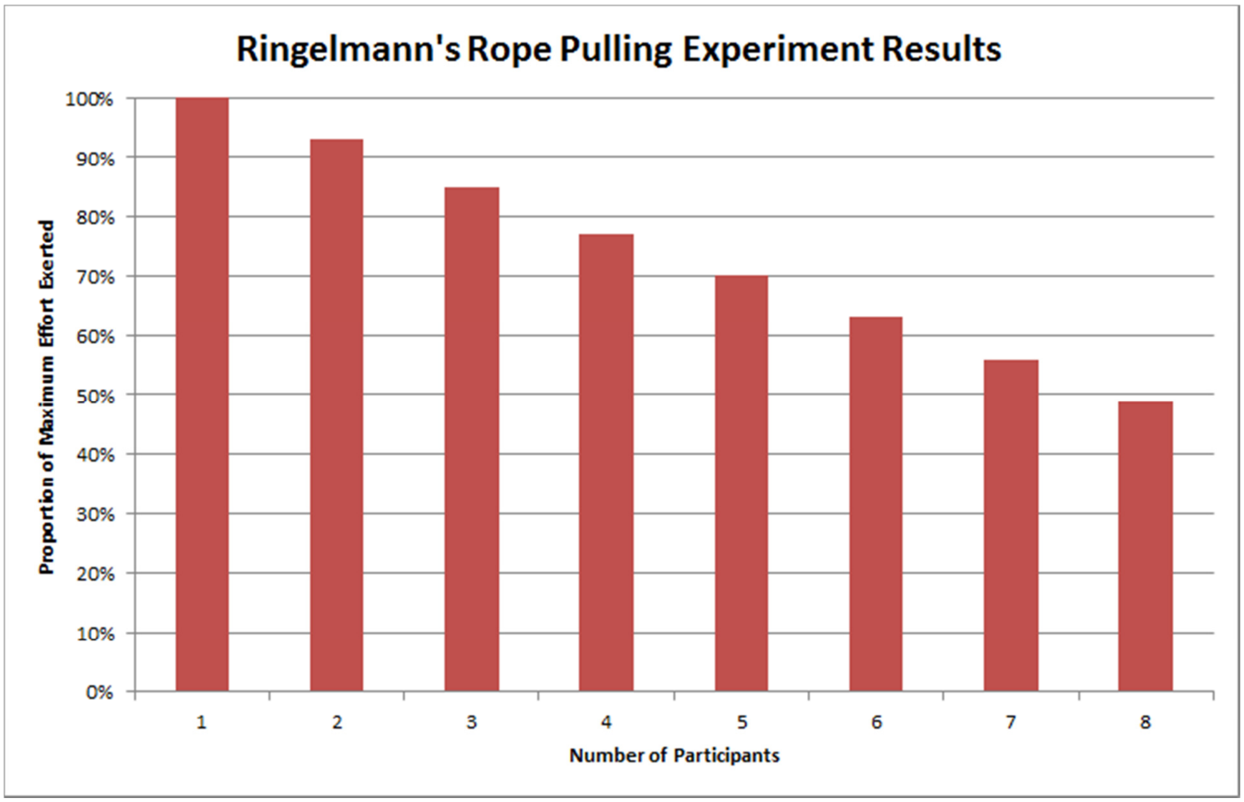
In 1913, French professor of agricultural engineering Max Ringelmann asked a group of men to pull on a rope as individuals and as part of a group. If you've ever been on a large group project, you might not be surprised to learn that the men exerted less effort when pulling the rope as part of a group than when pulling alone. In fact, the larger the group, the less effort each man contributed.

Here are the results of this experiment as shown in a great chart from Wikipedia:



To prove conclusively that this phenomenon is a result of "social loafing" (individuals exerting less effort in a group) rather than just poor group coordination, researcher Alan Ingham blindfolded his participants, telling some of them that they are pulling the rope on their own and others that they are pulling as part of the group. In reality, all the participants were pulling the rope on their own. Participants who thought they were part of the group exerted 20% less effort than those who thought they were pulling alone!

A meta-analysis of seventy-seven studies on social loafing by researchers Steven Karau and Kipling Williams in 1993 concluded that social loafing is a reliable phenomenon, displayed across numerous collective tasks and in countries around the world.

Social Loafing In Business

The bigger the company, the easier it is for an employee to hide his or her individual work. Unfortunately, the presence of free riders in the group (either perceived or actual), results in high-performing individuals scaling down their own effort. After all, nobody wants to be the "sucker" who does all the work while everyone else goofs off. If everyone in the group tries to avoid being the sucker, it results in bad group performance.

As social loafing and the sucker effect become part of your company's culture, it will only decrease everyone's productivity. Executives might try to change the company culture to reward productivity, but that is only a temporary fix. A business is only as productive as its weakest link.

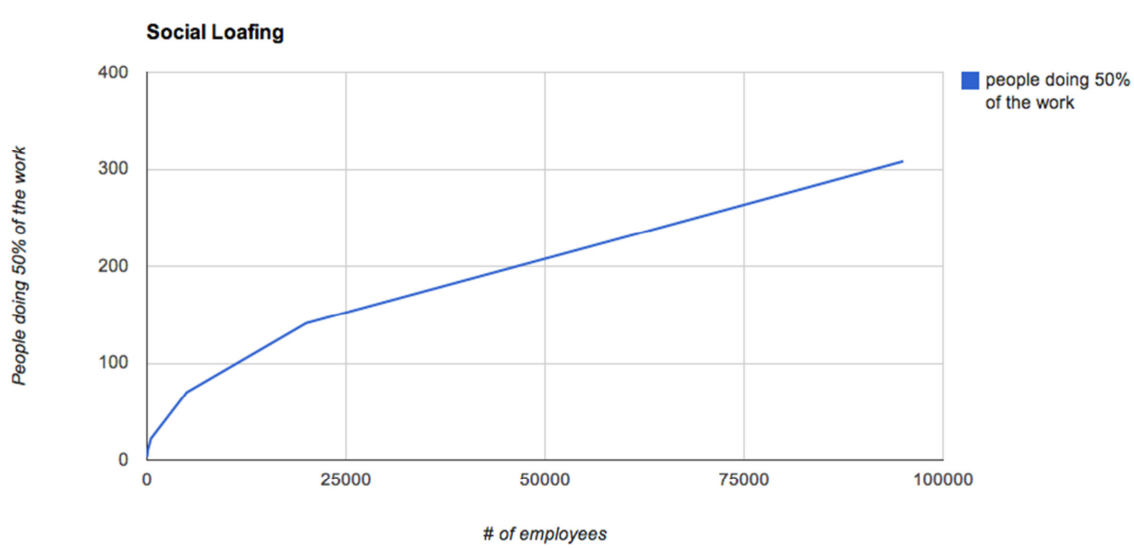
The Numbers

In the 1960s, scientist Derek De Solla Price analyzed the publishing of scientific papers and came up with a law that essentially quantifies social loafing. He found that roughly the square root of the number of people in an organization are responsible for 50% of the work.

Thus, as a group gets larger, exponentially less people do half of the work! Here is what this means for your business:

Business Size	# of Employees	People doing 50% of the work
Startup / Very Small	9	3
Small	100	10
Mid-sized	500	22
Large	5,000	70
Enterprise (Google)	20,000	141
Enterprise (Microsoft)	95,000	308

Here is the same data visualized:



Just think of the implications! With no social loafers and sucker effect:

1. A startup or very small business of nine employees can perform at the level of a 40 person organization.
2. A small business with 100 employees can perform comparably with a typical 5,000 person business.
3. A mid-sized business can outperform a large enterprise corporation, with an output comparable to a typical 125,000 person organization!

Can you afford to hire social loafers?!

How To Prevent Social Loafing

Social loafing is less likely to occur when one of the following conditions is present in your organizational culture:

1. Employees believe their individual performance can be identified and evaluated.
2. Employees feel that their work is important and meaningful.
3. Employees believe that their contribution is necessary for a successful outcome.
4. Working in your organization is valuable and important to employees, and individual employees like each other.

However, the data is clear, if you really want to keep your business performing at maximum capacity, you just cannot hire social loafers! Cream.hr's hiring assessment does a great job of weeding out the free loaders, who score low on conscientiousness and intelligence.

Why Less Is More in Teams

by Mark de Rond | 10:00 AM August 6, 2012

Why is it that American football uses eleven players, Canadian football twelve, and Gaelic fifteen? Why eleven in European soccer? Why does baseball field nine players, basketball five, volleyball six, water polo seven, and cricket eleven? Simple as these questions are, they are deceptively hard to answer. But whatever the historical reasons, the number of people on a team has significant impact on performance. Here's why.

The earliest known attempt to investigate the relation between team size and productivity dates back about a hundred years to the now famous experiments by French engineer, Maximilien Ringelmann. In a set of simple rope pulling experiments he discovered that, in what is now known as the Ringelmann Effect, people's efforts quickly diminish as team size increases. Eight people, he found, didn't even pull as hard as four individuals. He rationalized the decay in effort by suggesting it was difficult for team members to coordinate effort, and left it at that.

In a brilliant twist on Ringelmann, Alan Ingham and three colleagues in the 1970s decided to recreate the experiment in the basement of the University of Massachusetts Amherst. Whereas their replica of Ringelmann's experiment produced near-identical results, a clever variation on it — where, unbeknownst to others, some students were asked to merely pretend they were pulling the rope — generated an extraordinary observation. It didn't seem to matter whether people were part of a larger team or simply *thought* they were part of a larger team — they worked less hard. Thus in a team of six (where three had been asked to pull as hard as they could and three others instructed to pretend), those actually pulling the rope put in only as much effort as they had previously done in teams of six.

Ingham and his colleagues had demonstrated that loss of effort could not be explained by lack of coordination, as Ringelmann originally thought. Their experiments instead illustrated the problem of social loafing — when team members reduce their effort because they feel less responsible for the output.

Social loafing is one of the most documented phenomena in social psychology, and has been demonstrated on all kinds of teams including those that rely on people with different skill sets working in some coordinated fashion (such as those in today's workplace, since team tasks such as pulling a rope are relatively rare in the workplace). Since Ingham's recreation of Ringelmann's experiment, at least another eighty studies on social loafing have been published, based on a variety of tasks — including such complex tasks as brainstorming or rating poems for quality. In these experimental contexts, the research shows that people tend to prefer teams of four or, at most, five members. Anything lower than four was felt to be too small to be effective, whereas teams larger than five became ineffective.

The difficulty with studies of this type — and their applicability to today's workplace — is that they do not always account for task variety, where some tasks require a much larger skill set than represented by four or five individuals. Nor do they account for some people being more skilled at managing large teams than others. But they do remind us that smaller teams are generally better and, all other things being equal, that teams are more likely to optimize their performance when faced with slightly fewer members than the task at hand requires.

If reducing the size of your current team is not an option, how might you go about preventing or tackling social loafing? Not doing anything isn't an option — the team members you risk losing aren't the weakest but highest performers. Your best performers typically resent the company of those who don't pull their weight, particularly if the reward system doesn't adequately discriminate between average and top performance.

One option is to divide up a complex task into manageable bits, where every member of the team is accountable for one bit of it. Purists will argue that this no longer constitutes a team but a working group, with one central figure to coordinate everyone's output.

A second option is to generate a sense of urgency. As I've pointed out elsewhere, the key to effective teamwork is surprisingly straightforward: Provided that people are capable, all one needs to do is to give them something to care about more than themselves. The real problem is that this is difficult to do consistently.

A third option is to make weaker team members feel disproportionately responsible for the team underperforming — something formally known as the Köhler effect and, as far as I'm concerned, unappetizing and Machiavellian.

A fourth option is to provide greater transparency by opening up your feedback mechanism. Sports have the edge here in that, particularly in elite environments, systems are designed to measure performance on an ongoing basis, aided by increasingly sophisticated technologies. For example, in early 2007 the Cambridge University Boat Club embarked on a controversial experiment. Each week they would post not only objective performance results on the inside door of their ground floor gym but, right next to it, a sheet with five columns to cover subjective assessments by the coaching team. With your name in the first column, the coaches told you what you did well in the second column, and what you didn't do so well in the third column. The fourth and fifth columns were reserved for what you should stop doing, or start doing, immediately. Though somewhat uncomfortable, this left few places to hide.

Reality is such that few corporate environments allow for that sort of transparency. The question is what will?

http://blogs.hbr.org/2012/08/why-less-is-more-in-teams/

The Science Behind Why Small Teams Work More Productively: Jeff Bezos' 2 Pizza Rule

Written by Janet Choi

Bigger doesn't mean better when it comes to work. Jeff Bezos, the CEO of Amazon famously coined this with the 2 Pizza rule:

> One former executive recalled that, at an offsite retreat where some managers suggested that employees should start communicating more with each other, Mr. Bezos stood up and declared, "No, communication is terrible!" He wanted a decentralized, even disorganized company where independent ideas would prevail over groupthink.

According to Bezos, there have to be "two pizza teams": **if a team couldn't be fed with two pizzas, it was too big.**

Working with a small, scrappy startup team, I often find myself wishing for more brains on deck to work on cool projects, build more shiny features, and talk with our customers. It's just natural to believe that larger teams means you'll get more awesome stuff done, and so much more swiftly — which is why I was taken aback when I learned that **throwing more people at a problem is one of the most common productivity traps that you can fall into**.

In fact, the conventional wisdom that two heads are better than one — or the more brains you have on a problem the better — ***is completely wrong***. People in smaller teams are far more personally productive.

As group size rises, all sorts of issues spring up. **Individual performance levels diminish** and people start to grow less engaged. So while larger teams may be getting more done altogether, it's happening at a rate lower than the sum of individual efforts.

More people means more of everything — more good to great, and more bad and ugly — in rallying a group of human beings to get something done. Even if more people provide a greater pool of resources, they also require greater amounts of coordination and management, to the point where size becomes an impediment.

Forget herding cats, here's why herding humans is challenge enough. You have to grapple with these three hidden costs that start to climb: coordination costs, motivation costs, and relational costs. Let's take a closer look:

Coordination Cost: The Road to Missed Connections

The late Harvard psychologist, J. Richard Hackman, bluntly stated, "Big teams usually wind up just wasting everybody's time."

What Hackman found most important, though, is not the number of people but the links between them that accumulate when group size increases. The coordination cost proliferates with every new addition, **because management is a project of handling the links**.

Look at this formula showing how the links grow at an accelerating rate:

$$\text{\# OF LINKS} = \frac{N(N-1)}{2}$$

[WHERE N = # OF PEOPLE]

Let’s put this more simply:

- A small startup of of **7 people has 21** connection points to maintain
- A group of **12 has 66** connection points to maintain
- A group of **60 has 1770** connection points to maintain.
- A large enterprise of **6000 (Facebook’s headcount) has 17997000** connection points to maintain.

Each additional person increases total productivity of the team but at a decreasing rate, which means if you were the third member to join a team, you made a bigger impact on its productivity than if you were the thirtieth.

Every steep jump in links also produces a steep jump in the potential for mismanagement, misinterpretation, and miscommunication. Delays emerge from the snowballing time and effort required to keep everyone informed, coordinated, and integrated. There’s even a name for the delaying phenomenon in the software development world — Brooks’s law, which states that:

“adding human-power to a late software project just makes it later.”

To contrast, consider groups like the Finnish games company, Supercell, composed of only about 100 employees but making $2.5 million a day, with two “top grossing games … built and launched in six months by teams of five and six people.” **That magic number for the most effective teams varies, falling anywhere between four to nine, and more often six or seven.**

What’s clear is that if you want your herd of humans to get more stuff done, avoid having your team numbers hit double digits.

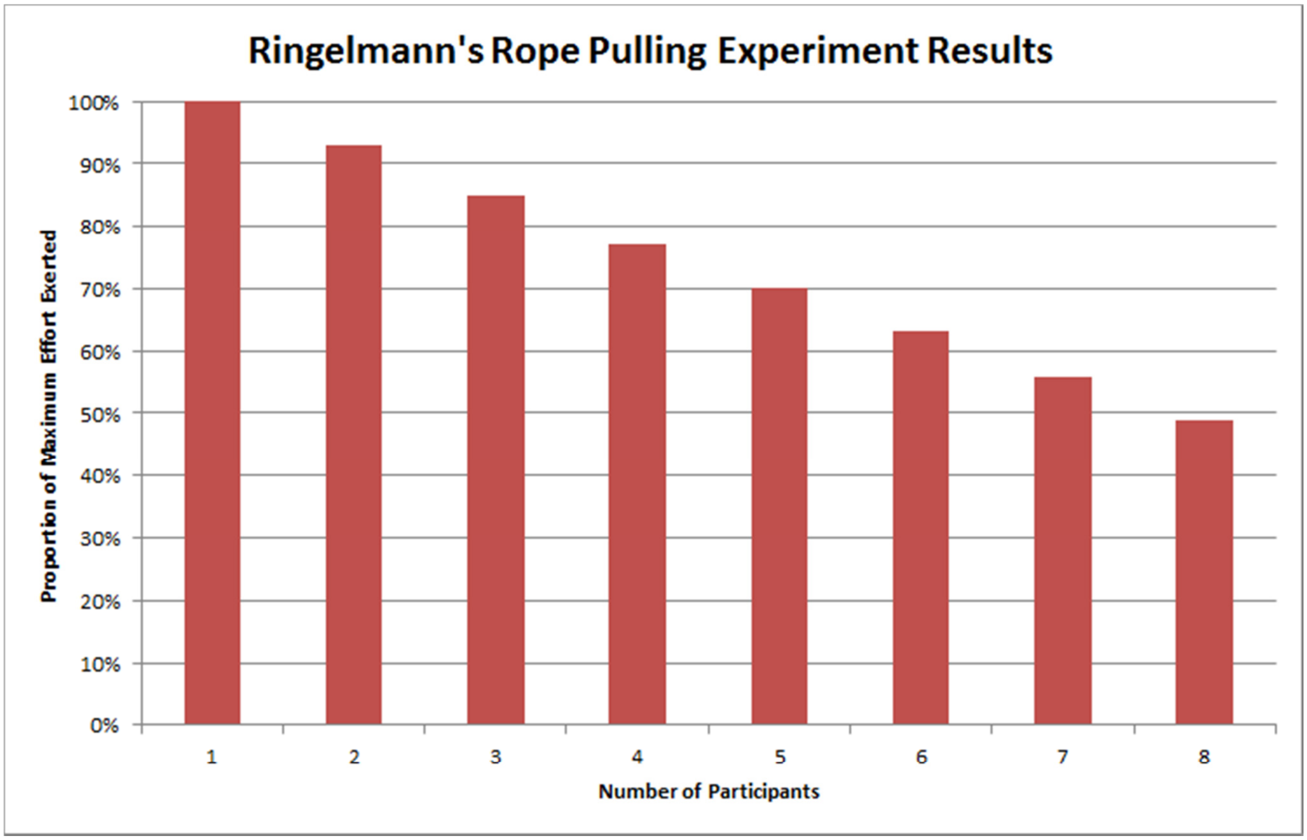
Motivation Cost: The Discouragement of Getting Lost in a Crowd = Social Loafing

The mere perception that you’re in a group can deplete your own motivation and effort, a phenomenon known as social loafing.

A classic study by Bibb Latané demonstrated the social loafing effect with groups as small as two to six. Participants wearing blindfolds and noise-masking headphones had to shout as loud as they could. ***Everyone made less noise in groups compared to when they shouted alone.***

While the total sound produced was louder, it didn't grow in proportion with the group size. People in teams of six shouted at 36% of their full individual capacity. When researchers controlled for any possible coordination loss by having participants shout in pseudogroups — fake groups where participants believed they were shouting in concert when they were actually shouting alone — people still didn't perform at full capacity, producing 74% of their full potential sound.

We can probably best explain this phenomenon with Ringelmann's Rope pulling experiment. It shows more clearly than anything how input per head decreases as group sizes get bigger:



Social loafing is a feedback problem. Latané and his colleagues explained that:

"when groups get larger, you experience less social pressure and feel less responsibility because your performance becomes difficult, or even impossible, to correctly assess amidst a crowd. It's no wonder that when credit and blame get harder to assign, you start to feel disconnected from your job."

While initially you might not be cognizant of social loafing, that unconscious disengagement can quickly morph into rational, self-interested behavior and active disengagement. If you don't feel like you matter, then what's the point of trying so hard? That's one worrisome threat of spiralling disconnection and decreased motivation.

Relational Loss: Why individuals in larger teams perform worse

Coordination loss and motivation loss are concepts that have been around for awhile, based on Ivan Steiner's 1972 theory of process loss. But psychologist and University of San Diego Professor of Management, Jennifer Mueller uncovered "relational loss" as the third element of why individuals' efficiency decreases in larger teams.

Relational loss is when you feel as if you are receiving less and less support as teams get larger. This includes emotional support, assistance in performing work and overcoming setbacks, and informational support to help solve problems. Think about your worst workdays — and how much harder it is without a shoulder to lean on or someone to help you out of a jam.

Steiner's theory was missing the fact that when you're on a team, you regularly interact and spend time with each other every day. Mueller suspected that the deteriorating quality of those multiplying links contributed to weaker individual performance. Just think about how the more friends you amass on Facebook, the weaker those ties usually are.

Studying 212 knowledge workers throughout multiple companies in teams ranging in size from three to nineteen, Mueller analyzed data derived from performance evaluations, given by both peers and team leaders, as well as questionnaires on motivation, connectedness, and coordination. She found, as she says, "compelling evidence for relational loss — it loomed larger than you might expect given how much emphasis is given to coordination." People's perception of support decreased as team size increased and this relational loss accounted for poorer individual performance.

The price of relational loss is paid with feelings of isolation and chronic stress, which harms cognitive ability and causes poorer performance. Mueller remarks on how tremendous amounts of stress in larger teams were particularly striking, with one person even calling work a "death march":

> "[I]n these larger teams, people were lost. They didn't know who to call for help because they didn't know the other members well enough. Even if they did reach out, they didn't feel the other members were as committed to helping or had the time to help. And they couldn't tell their team leader because [it would look like] they had failed."

4 Effective ways to address these size-related losses and operate as small teams:

To steer toward sweeter pastures of engagement and productivity at work, **manage the links**. Here are a few ways for you and your troupe to start receiving the benefit of smaller teams:

- **Figure out the right communication tools:** The cult of productivity is often inwardly focused on the personal while neglecting the needs of the collective. Find and use "generous" tools and processes that lower coordination cost and save other people time as well.

This may mean finding friendlier collaboration apps or changing how you participate in and run meetings. iDoneThis, for example, is a slow web tool that allows you to stay in sync with your team, creating meaning and connection through an adaptable cadence of communication rather than causing frustration and guzzling time.

- **Make teams feel smaller**: Get chummy with your coworkers and get to know each other better. That holiday party or happy hour may seem like some silly work event, but outings and work trips allow you to build a rapport and have some fun.

  Be adventurous, explore your office or virtual watercooler, and find new ways to connect, like Zappos's "face game" (upon logging into the computer system, you guess the name of a coworker whose face pops up and then see his or her bio).

- **Become radically transparent:** Transparency helps prevent behavior such as social loafing and free-riding, which rely on the fact that there's somewhere easy to hide, and power plays, which rely on hoarding knowledge like an information miser.

  The often-disregarded half of your job, other than doing your work, is communicating about it. Tell people about what you do, and make knowledge accessible, visible, and therefore collective by writing things down, chronicling decisions and processes, and being inclusive.

  Take a page from the amazing Buffer team and make transparency more than a buzzword. They share a wealth of information about each other, from salaries to daily learnings and progress, to how much sleep everyone gets. The result is a positive, protective shield against relational loss.

- **Put on your connecting and troubleshooting capes**: Instead of shrugging your shoulders, stretch beyond the limits of a particular role to participate in an all-hands approach. Use your genius skills to save the day by figuring out how best to connect needs to abilities when someone looks like they need help.

  And in already-large teams, Professor Mueller suggests putting a person in the non-leadership role of a team troubleshooter. This is someone who steps in when people encounter obstacles while allowing them the psychological freedom to talk about their problems.

- **Give frequent feedback to each other:** Don't isolate feedback to some twice-a-year supervisory formality. Get the conversation flowing among everyone in your group to help strengthen the connections between individual effort and performance, which get swallowed up in the crowd through motivational loss.

  Ask questions, show your teammates gratitude and appreciation, and respond to distress signals. Creating a high frequency feedback culture, like the one at Zapier — where there are daily discussions on what everyone gets done and monthly one-on-ones — helps everyone be better at their jobs.

We could all learn a lesson from thinking smaller. Putting some thought and effort into how to communicate better, opening up channels for more conversations, and strengthening supportive and meaningful emotional connections make work about creating something great with your teammates instead of fading away on some stressful, lonely death march.

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