# On The Tardiness Of Coworkers And How To Exploit It

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**Abstract** Nothing more annoying than being on time in a meeting. It means having to wait for others to arrive and thus waste a considerable amount of your own time. We propose a solution so that you can always be late while maintaining the precious moral high ground you need to be able to complain about others.

## 1 Introduction

Tardiness of coworkers has been a nuisance to mankind ever since cavemen Ugh, Ogh and Agh decided to hold a meeting on how to catch the mammoth. Of course, since Ugh was late, the meeting took a turn for the worse, the mammoth got away and the tribe starved later that winter [4].

In the year 490 BC, the Battle of Marathon was held. The Athenians led by General Miltiades defeated the numerically much stronger Persians, ending the the First Persian War in favour of the Greeks. A Greek soldier ran from the battlefield in Marathon to Athens to report this victory, even though horses, mules, elephants, ostriches and numerous other animals were plentifully available at the time and could have taken him there faster. Needless to say, he arrived late at the hospital in Athens, which lead to his death [6].

A similar series of events took place in Middle-Earth. I mean, Frodo and Sam could have easily taken the eagles from the start and get to Mount Doom way faster, rendering all the blood spill in the nine-hour movie futile. A thorough analysis is given in [8].

In "The Irishman" [7], a meeting between Jimmy Hoffa and Genovese crime family Capo Anthony "Tony Pro" Provenzano started 10 minutes late. Hoffa makes the points that anyone who shows up to a meeting more than ten minutes late isn't just late, but making a point. Needless to say this further deteriorated the relationship between Hoffa and the Italian mob, with dire consequences for both Hoffa and by extension the International Brotherhood of Teamsters.

In [9], the authors explain the aspects of people being late to meetings. I did not actually read it, but I'm pretty sure it says something like how it's annoys people who do arrive on time. Moreover, the aggregate waste of time is a significant cost for an organisation. Not to mention the effect on moral. From this perspective, it makes sense to advocate being on time.

A famous German saying goes "Pünktlichkeit ist fünf Minuten vor der Zeit" [3]. Unfortunately, scanting German sentences at the office is only politically correct if either David "the Hoff" Hasselhoff, Heino or Rammstein first uses it as a lyric in one of their songs. And even the latter is somewhat questionable. Anyway, without the explicit OK from contemporary German pop culture, you are on thin ice yelling this in the meeting room, lunch room, elevator or parking lot. Let alone slipping this in a deliberate clumsy "reply all" on a meeting invite.

Unfortunately, there are several flaws in trying to get your coworkers to show up on time. First, they still won't be on time. Second, you become unpopular. The same happened to Jesus H. Christ, see figure 1. Third, you can no longer afford to be late yourself. This means you are doomed to always be on time and wait for 15 minutes like a dumbass for the meeting to actually start, even though you knew beforehand that you would loose this time.

As this work will show, there is a better way to exploit the phenomenon of tardiness. We reformulate this as an optimization problem with two objectives. First, you want to be as late as pos-


**Fig. 1:** Jesus becoming ostracized for addressing tardiness.


**Fig. 2:** A moron that showed up on time for a meeting waiting for others to arrive.

sible, so that you do not loose too much of your own precious time. As you are now one of the tardy people, the assumption that everyone else's times is in fact less valuable than yours, is now a valid one. Second, you still want to have moral superiority over the majority of the group of attendees. By that we mean that you want to be in a position where more people enter the meeting after you do. In that way, you can still blame the majority of (tardy) attendees for the flagrant waste of everyone's time.

For example, for a meeting of six people, the sweet spot seems to be to arrive third. You kept two people waiting (the so called "morons", see figure 2 for an example), but you can still blame the last three people arriving for the lateness of the meeting. If you were to come in fourth, then three people can be mad at you, while only two can be blamed. In this case, you have lost the moral high ground. This is to be avoided at all times, as shown in figure 3.

There are a few factors that make this a really challenging problem.

First, you do not know when people will arrive. Now, you could hide in the hallways outside the meeting room and jump from behind the plants or something when you think you are at an optimum time to do so. But unless you are some sort of creep that is into that kind of voyeur stuff, you will still actually loose time with this strategy. So, instead you need to rely on utilising good old fashioned statistics to make adequate predictions. Luckily, most people are like clockwork (it's always the same ones that are late and for the same reasons). We elaborate more in this in the next section.

Second, all animals are equal but some are more equal than others [2]. This means that the opinion of your coworkers has to be weighted by their seniority. A more senior member is somehow allowed to be late, because his time is supposedly more valuable. We observe the following categories in an academic setting like a university:

1. Bachelor students. These can not afford to be late. Moreover, listening to their opinion is generally seen as a waste of energy and thus bad for global warming or the environment in general. People in this category don't matter, so their weight in the optimization problem is effectively zero. If you outrank them, you can have them wait outside in the cold and the rain for an hour and still yell at them for not doing their lab preparations properly as they enter your room half frozen to death.

2. Master students. They can crap on the bachelor students because they "know stuff", but that is it. Also a weight of zero.

3. PhD students. This is our baseline. We give people in this category a weight of 1.

4. Post-docs. These ones like to swing their ******* around in the absence of professors.

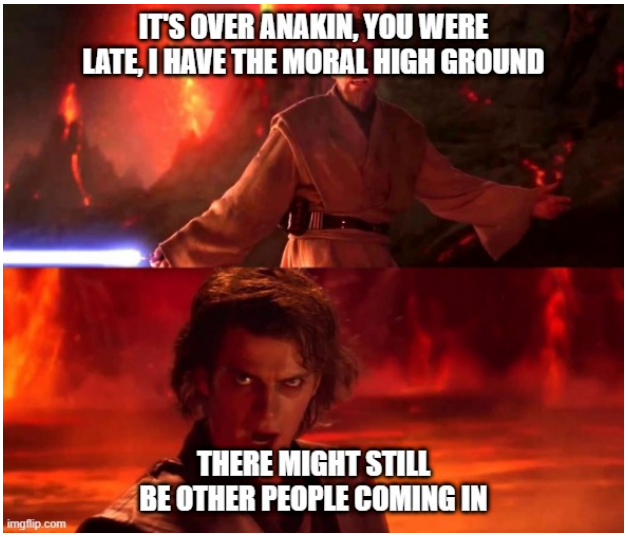


**Fig. 3:** The origin of one of the most evil supervillains in history can be traced back to Anakin showing up late on Mustafar.

Otherwise, they are really quiet. Be that as it may, they are twice as important as PhD students, so we assign them a weight of 2.

5. Professors, deans and vice-deans. God-like creatures. These have a weight of infinity. Always be in a meeting before them. Only professors can attack other professors for being late. Do not get caught in that crossfire.

A similar set of categories can be defined in industry, healthcare, ...

Perhaps another example. You, a PhD student, are invited to meeting with four more PhD students and two post-docs. They arrive like this: PhD, PhD, post-doc, PhD, PhD, post-doc. At what point do you come in? The weights are: 1, 1, 2, 1, 1, 2, which totals to 7. Add yourself to get 8. Divide that by 2 to get 4. So, this is the ideal sequence: PhD, PhD, post-doc, you, PhD, PhD, post-doc. There are six people plus you in that meeting. You kept three of them waiting (again, the morons), and three are later then you. The total weight for morons is $1 + 1 + 2 = 4$. The total weight for the tardy ones (that enter after you) is $1 + 1 + 2 = 4$. You can safely join the morons and start badmouthing the tardy ones. What if you arrived one place later? Then the total weight for the people before you would be $1 + 1 + 2 + 1 = 5$. And the for the people behind you it would be $1 + 2 = 3$. The morons would consider you part of the tardy ones. That is 5 against 3 + you. This is sub-optimal in a debate over the last doughnut. What if you arrived one place sooner? Then the weights would total to $1 + 1 = 2$ for the morons and $2 + 1 + 1 + 2 = 6$ for the tardy ones. You would be seen as "on time", but also part of the morons, because you could have easily been later.

A third reason why this optimization problem is so complex, is that we can not use out of the box probability distributions like the exponential distribution. This model would fail, because it assumes independent events, i.e. arrivals of people. This is certainly not the case. People tend to arrive in pairs or even larger bursts. When people see each other in the hallway, they tend to cluster, obeying an inverse square distance law like magnets or gravity. Unless those two can not stand each other, or the slower one needs something from the faster one. In the latter case, a sad race emerges. People also bump into each other when getting that "it's already one minute past the start of the meeting but I still can get a cup of coffee or go tinkle and somehow still be on time". As multiple people have this brilliant idea simultaneously, they meet at the coffee machine or toilet and start yapping about their day, kids, sports, the weather, someone who is not around, ... Meanwhile the morons are waiting in the meeting room. The point is, people flock together.

These three reasons combined (not knowing when people arrive, weighting their opinion by seniority and people arriving in clusters), make for a very dangerous Russian roulette kind of situation where you can end up either a moron or a tardy one. To model this, we need the mother of all statistical processes called a Gaussian process. This non-parametric non-linear regression technique can handle low data regimes and uncertainty propagation in a Bayesian framework [10].

The contributions of this paper are: We reformulate being too early versus being tardy as an optimization problem, in which we try to predict when the ideal time for you to arrive at a meeting is. You will be late, but only a minority of opinions will suffer from your complete lack of respect for other peoples times. In the end you will save time by never being too early again.

The paper is organised as follows: there are sections and subsections.

## 2 Methodology

### 2.1 Gaussian Process

As stated in [10], a Gaussian process (GP) can be defined as a continuous collection of random

variables, any finite subset of which is normally distributed as a multivariate distribution. In this section, we will limit ourselves to the formulas, as they are somewhat trivial to explain.

Let a dataset $\mathcal{D} = \{X, \mathbf{y}\}$, where $X = \left[\mathbf{x}_1, \mathbf{x}_2, ..., \mathbf{x}_n\right]^T$ and $\mathbf{y} = \left[y_1, y_2, ..., y_n\right]^T$

$$y = f(\mathbf{x}) + \epsilon, \quad \epsilon \sim \mathcal{N}(0, \sigma_\epsilon^2), \tag{1}$$

$$\begin{bmatrix} \mathbf{f} \\ \mathbf{f}_* \end{bmatrix} \sim \mathcal{N}\left( \begin{bmatrix} \boldsymbol{m}_X \\ \boldsymbol{m}_{X_*} \end{bmatrix}, \begin{bmatrix} \mathbf{K}_{X,X} & \mathbf{K}_{X,X_*} \\ \mathbf{K}_{X_*,X} & \mathbf{K}_{X_*,X_*} \end{bmatrix} \right), \tag{2}$$

$$\mathbf{f}_* | X, X_*, \mathbf{y}, \boldsymbol{\theta}, \sigma_\epsilon^2 \sim \mathcal{N}\left(\mathbb{E}(\mathbf{f}_*), \mathbb{V}(\mathbf{f}_*)\right), \tag{3}$$

$$\mathbb{E}(\mathbf{f}_*) = \boldsymbol{m}_{X_*} + \mathbf{K}_{X_*,X}\left[\mathbf{K}_{X,X} + \sigma_\epsilon^2 I\right]^{-1}\mathbf{f}, \tag{4}$$

$$\mathbb{V}(\mathbf{f}_*) = \mathbf{K}_{X_*,X_*} - \mathbf{K}_{X_*,X}\left[\mathbf{K}_{X,X} + \sigma_\epsilon^2 I\right]^{-1}\mathbf{K}_{X,X_*}. \tag{5}$$

$$\log p(\mathbf{y}|\theta, X) \propto -\frac{1}{2}\left[\mathbf{y}^T\left[\mathbf{K}_{X,X} + \sigma_\epsilon^2 I\right]\mathbf{y} + \log|\mathbf{K}_{X,} \tag{6}$$

$$\left[\mathbf{K}_{X,X} + \sigma_\epsilon^2 I\right]\mathbf{y} = L^T \setminus (L \setminus \mathbf{y}). \tag{7}$$

$$k_{SE}(\mathbf{x}, \mathbf{x}') = \sigma_f^2 \exp\left(-\frac{|\mathbf{x} - \mathbf{x}'|^2}{2l^2}\right), \tag{8}$$

$$k_{SEARD}(\mathbf{x}, \mathbf{x}') = \sigma_f^2 \exp\left(-\frac{1}{2}\sum_{j=1}^{d}\left(\frac{\left|\mathbf{x}_j - \mathbf{x}'_j\right|}{l_j}\right)^2\right). \tag{9}$$

If you ever get lost in these equations, just remember that a 2D Gaussian distribution kinda looks like a nipple. It will not help you, but you will briefly feel better.

### 2.2 Gathering the data

This couldn't be easier, as most of us are in many meetings on a daily basis. We recorded the arrival times of individuals for 10000 of our own meetings, which took us about three days. The results can be found in the supplementary material on GitHub in a private repository only I can access due to University valorisation policy: https://github.com/meeting-recordings/.

Our experiments were run on a Windows 3.11 container of a computer. We have a dependency on FAT16, so make sure your HDD is not bigger than 2 GB (4 GB for Windows NT).

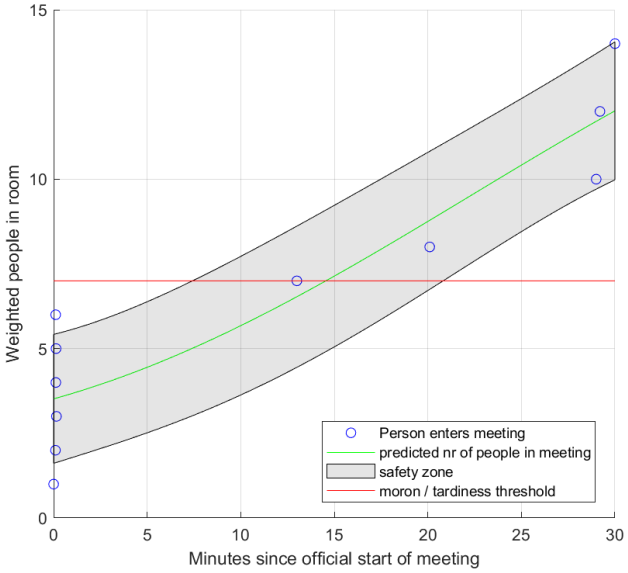


**Fig. 4:** A meeting starting with a lot of morons showing up on time.

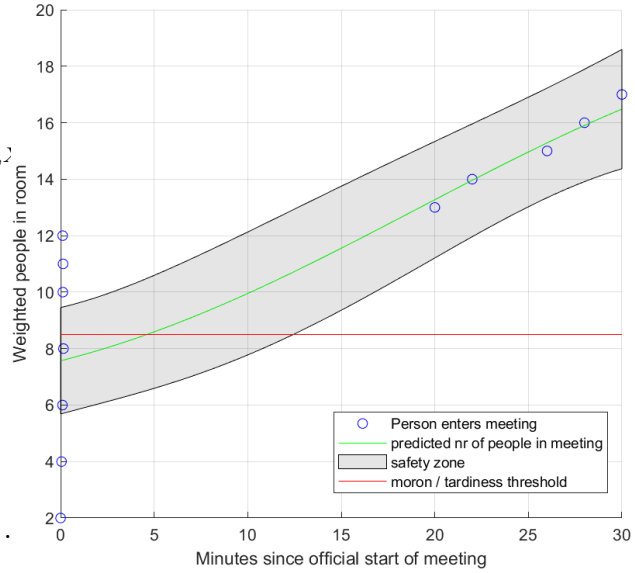


**Fig. 5:** A meeting in which a lot of post docs were on time.

We fit a Gaussian process on the weighted number of people in a meeting room versus time. The resulting plots can be clustered in three main categories. Examples of each are given in figures 4, 5 and 6, which will be discussed in the next section.

## 3 Results

Maybe you already forgot, but in this section we will discuss figures 4, 5 and 6.

In figure 4, we see typical behaviour of the morons: six showed up on time. However, three postdocs were 30 minutes late. There opinion matters more. In total there are 14 weighted people (8 PhDs with a weight of 1 and three postdocs with a weight of 2). So, the moron / tardi-

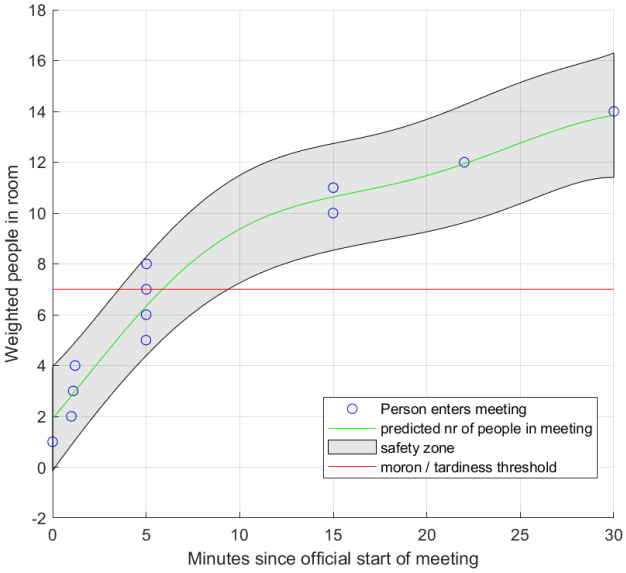


**Fig. 6:** Bursts of people walking in.

ness threshold is at $\lfloor 14/2 \rfloor = 7$. This means you can safely be the guy entering 13 minutes late. That would mean a weighted seven were on time, and seven were late (according to your egocentric perspective of course). So that is a tie. The amount of people that can be mad at you is not large enough for you to care. You keep the moral high ground.

Figure 5 shows a sneaky one. Five post-docs and two PhDs were on time. This can only happen if

- by coincidence, they had another meeting in the same meeting room before this meeting.
- they could not figure out that 15:00h is in fact 3pm and not 2pm.
- this is a Teams meeting and they forgot about time zones.
- this is a lunch meeting with free food, but the tardy ones get stuck with the vegan sandwiches.
- these are physicist who found a way to mess with the space-time continuum.
- these are robotics engineers who send their avatars.

In any case, look at how the moron / tardiness threshold has already been surpassed at the start of the meeting. In this case, you have to be on time. There is no way to recover from being late for this one.

As a final example, we present figure 6. People enter in groups of two or three. If you want to keep the moral high ground, you need to be in the second trio. The last four guys will feel the wrath of the two trios. Even if the last guy is in fact a post-doc.

# 4 Discussion

At first glance, you might be thinking "well that is all fine if you have such a curve, but you only can make that plot after you recorded a meeting. How about for meetings that haven't happened yet?". It turns out that people are creatures of habit. This makes them very predictable. In fact, even when people find out you are timing them, they will still be late [1]. Moreover, you probably have a lot of similar meetings (faculty meetings, lab meetings, supervisor meetings, scrum meetings, ...). Just group them together.

Our method also works in other settings like having diner at your parents' house. Let's say you agree on 6pm [5]. Your brother is also invited. On average, he is 15 minutes late. Simply show up 14 minutes late and talk shit about him to your mother. Argue that his tardiness is ruining the meal. For instance say something like "Weren't those pork chops done 10 minutes ago? I sure hope my brother won't be long now". She will be reaching for that wooden spoon to hit him in no time, while you saved 14 minutes of your own precious time.

Finally, if you can, always peak through a window before entering a meeting room. In the off case you miscalculated, or someone is (more) on time because they wet their bed, you can no longer enter unless you can still keep the moral high ground. If you are well above the moron / tardiness threshold, do not go in. Just drop to the floor and weasel out of there as fast as you can. If you get some sort of backlash from being absent, just remember that this is still better than being perceived as late. You can also make something up to cover for your absence like

- the lab was on fire and I had to save the rats in the trash.
- I was coming down with the awesome-virus, but I beat it.
- I was having "woman issues". Ironically, this works even better if you don't openly identify as a woman. No one in their right mind will dare to ask a follow up question.

Always end your excuse with a sound "I sure hope you didn't wait for me and started the meeting on


**Fig. 7:** Sneaking away from coworkers..

time." This will deflect the attention towards the tardy ones, leaving an opening for you to sneak away. An example can be seen in figure 7.

## 5 Conclusion

For a conclusion, just copy paste all of this in https://openai.com/blog/chatgpt/. I mean at this point, really ...

## 6 Acknowledgements

We would like to thank the dozens of lower tier students that are probably still standing outside our lab right now, waiting for us to open the door.

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