

## THE THREE BY THREE



LEADERSHIP INSIGHTS FROM PHYSICS, OR AT LEAST FROM PHYSICISTS

Michael Clingan, The Claymore Group

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## Introduction

*The Three by Three* is a framework for improving leadership effectiveness. It provides a means to understand the most important aspects of the interaction between the leader and the led and to help the leader accelerate progress towards their goals.

But before we get into the details it's import that you know something about me - the reason why will quickly become obvious. I'm a physicist who is also a business person and someone who has also been a leader in many different capacities.

There are of course many people who are physicists and many many more who are business people and leaders. But I may be different in that even though its been many years since I was in a lab, I still think like a physicist, I only accidentally became a business person, and for over forty years I've been fascinated by the subject of leadership.

I've been told that I think "weird" and that being a physics-brained, business accident, leadership fanboy is more than a little usual.

But sometimes this unusual background produces some equally unusual insights. I'd like to share one with you that I call *The Three by Three*. I've found *The Three by Three* to be a very useful way of understanding the role of the leader, the role of followers and the dynamic between them.

And get this...the ideas in *The Three by Three* are brought to you by other physicists. This isn't really a big surprise as physics actually started out being something called "natural philosophy" - it was an extension of "regular" philosophy which has always included topics such as why and how people should live and work and how they should behave towards each other.

Of course modern physics students don't take classes in optics, quantum theory and leadership. But the way physicists think about situations is rooted in philosophy and some of the results of modern physics "port" back very nicely to those roots. Physicists have researched and written extensively on system and organizational performance and optimization, quality control, production management, the effects of measurement and even on the nature and benefits of dialogue.

In *The Three by Three* we'll see how three physicists say something important about leadership - one about how each person sees the world in a truly unique way, one with thoughts about change and the leader's role and one who, almost 2,400 years ago, succinctly described the core attributes of successful leadership.

## Frames of Reference

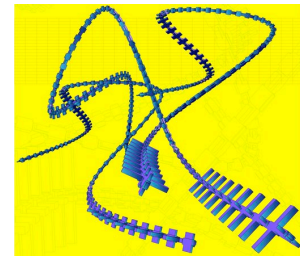
For years physicists wrestled with understanding the implications of something called the Lorentz Transformations. These transformations are just a couple of mathematical equations describing what happens to objects or with time as things move closer and closer to the speed of light.

But if math is really the language of science, it is true no where more so than in physics. Unfortunately, sometimes the math tells us things we don't understand and the Lorentz Transformations were one of those times.

One of the troubling implications of the Lorentz Transformations is well known in popular culture and is called the Twin Paradox. In the Twin Paradox one twin boards a spaceship and travels at about 87% of the speed of light for what seems to him to be 5 years. When he gets off the spaceship he finds his twin to have aged ten years. What happened?

It literally took an Einstein to figure out a solution to this paradox. How could two people have such a different experience with something as simple as time? And not just the perception of the experience, experiments demonstrate that one twin really would get older.

Young Albert had been a clerk in a pretty undemanding job. In his spare time he had ran little cartoons in his head about rulers traveling at the speed of light and light itself (we'd call those cartoons virtual reality simulations today since we're far more sophisticated). Anyway, Albert created cartoons of the twin paradox and similar situations from various perspectives and he began to understand the Lorentz Transformation equations in a fresh way. He turned their old interpretation inside out, wrote a paper or two and launched a reasonably successful career as a scientist.



What Einstein suggested was that the laws of physics are consistent for a given inertial frame of reference. "Inertia frame" meaning traveling in a constant speed and direction and without rotating. We now call this whole concept "special relativity." And as with many things "physics", the math of special relativity can sometimes get fairly ugly, the sound-bite version can sound pretty simple and the implications can change the way we see the world.

## The Power of Three

So how specifically does this bit of physics history contribute to the study of leadership?

Before we get to that, just a tiny little bit of accidental business person insight: Most of the time, for a given business position or job, there are three things to which you should really pay attention: For general management - revenue, costs, profit. For sales - leads, prospects, customers. Operations - throughput, quality, on-time delivery. Project management - scope, resources, time. A non-profit might have fund raising, volunteer staff size and service level.

Now most people certainly have more than three performance objectives at work, in fact I've known people with as many as 28 "key metrics". Of course with that many things to optimize, and with some metrics actually competing directly with others, there's no way those people or their bosses could ever be 100% satisfied with their job performance. They tended to play "shell games" with their metrics, emphasizing those most favorable at any given

point in time while doing their best to hide others. It was a lot of work. And they certainly couldn't concentrate on all 28 at once.

Studies have shown that five "objectives" is the maximum that most people can have without impacting overall performance, but in my experience, three "big" things on which to focus seems to be optimum for most day-to-day business functions.

We see a similar effect in physics. Physicists like to plot stuff on graphs - we draw pretty calibrated pictures and a many more not-so-pretty ones on the backs of envelopes or whatever else is handy. These plots help us to better understand situations and to see if a theory does a good job at predicting real-world behavior. We may talk in four, nine, sixteen and even more dimensions but we plot in two or three. (Have you ever tried to draw in 9D?) Many times we plot stuff in three dimensions, sometimes in cylindrical coordinates  $(r, \theta, h)$ , sometimes in polar  $(r, \theta, \rho)$ , sometimes in Hilbert Space (don't ask), and sometimes in Cartesian coordinates which is just the official name for the good old  $x, y, \text{ and } z$  axis. So again with the threes but we always try pick the three that give us the most insight into what's going on. The three dimensional viewpoint of physics corresponds to the three key metrics or attributes of business.

Let's begin tying these ideas together:

Assume the existence of a leader. A leader is someone with willing followers. The interaction between the two, the leader and the followers probably doesn't exist forever, but rather for a finite time. It's as if their paths start off separately, mingle for a bit and then head off on different trajectories.

Since the two paths are not the same each has it's own inertial frame of reference. Now sure, you could have said that different people see the world in their own way, but then it wouldn't have been physics and the difference in perceptions might not seem as intrinsic and permanent as they really are.

In fact, those differences are profoundly intrinsic and permanent and understanding them is vital to leadership success.

### **More Physicists Weigh In**

Our second physicist, Eliyahu Goldratt, author of *The Goal* and father of the *Theory of Constraints*, identified that a leader is someone who facilitates a positive change in state for the organization. Better service, higher profits, less variation in quality, etc.

Goldratt says that leaders should focus on three questions: What to change?; What to change to?; and How to make the change? Those are the leader's three dimensions and describe their inertial frame of reference. That's what they should care about and what they should track. So much so that the quality of the answers to these three questions determines how a leader perceives their own ability to lead. And their boss might want to know these answers as well.

Everything a leader does falls into one of these categories of questions. Sometimes we express it more elegantly or at least with more words. Something along the lines of historical performance, SWOT or gap analysis instead of "what to change"; benchmarking, best practices and stretch goals instead of "what to change to"; and an implementation plan, five year strategic plan or something usually called "Project 2015" instead of "how to make the change."

What about those that are following a leader? While followers each have individual frames of reference, as a group, they have a collective inertial frame of reference, again with its three primary dimensions - three things followers expect, and may even ultimately demand, from a leader.

These three expectations are to help them understand who they are as an organization, to share a vision as to where they are going and to make them feel like the leader can get them there safely. Interestingly, these are components of a myth or story and a good organizational story is a very powerful thing. No wonder that many of the most successful leaders are also excellent storytellers.

It's worth noting that while followers want to identify someone that can safely get them to where they're going, nothing in the leadership job description says it has to be done through heroic means. As it turns out experimentally, or at least in the real world, the most successful leaders are only sometimes heroic.

Now you can plot the leader's three dimensions and you can plot the follower's three dimensions. And they are different. But they can overlap and interact for a period in time. And when they do, and when the story is a good one, a miracle can happen.

(Disclaimer: Please note that "miracle" is not an accepted term in physics - I known having tried this on several PhD level quantum mechanics exams. And since the dot com bubble burst, it's also apparently not an acceptable strategy in a sales and marketing plan.)

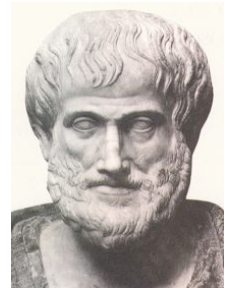
A miracle can happen when the leader's "what to change?" acknowledges and builds from the follower's "who are we?". Or when the leader's "what to change to?" is compelling to the followers and simulates their desire to make a journey. And when the follower's requirement of safety is addressed by the leader's plans on "how to make the change". Huge miracles can happen when all three of the above happen at once.

So we have two inertial frames of reference, the leader's and the follower's. Is there a third? You bet. In fact there are many - that of suppliers, investors, customers, peers, bosses, competitors and the press come quickly to mind.

One I find to be of particular interest is the inertial frame that can clearly see both the leader's frame and the follower's but is in neither and may not be in any of the others mentioned. This would be the frame of reference of an interested observer close to, but outside of the organization. The proverbial fly on the wall. What would they see during one of those miracles?

They would see the relationship or the interaction between the other two, the leader and the followers. To describe this relationship succinctly I'm going our third physicist. In this case, the original physicist, the big guy himself, Aristotle.

In addition to being a physicist even before it became a college major, Aristotle was a leadership trainer. Alexander the Great was one of his students - when he was known only as King Philip's son Alex, he'd been identified as a high potential future leader, sent to train with Aristotle, learned the organizational ropes on the front line (literally), all before dying at 32. By then of course he'd conquered a big part of the known world.



And throughout his brief career he modeled the leadership skills he'd learned from Aristotle.

Aristotle saw leadership in exactly three dimensions - in Greek those dimensions are called ethos, pathos, and logos. Ethos being knowing and being true to one's values, pathos including both passion and empathy, and logos being the ability to think clearly and communicate effectively.

The leader must initiate each of these traits and be responsible for their maintenance. Otherwise the followers will simply find a new leader that does. Or at least one that does some subset of them better.

Back to our observer who is watching the interaction between the leader and the followers. If the relationship is good and productive, they'll see the leader radiating the three dimensions of ethos, pathos and logos and they'll also see the followers verifying that each trait is truly in place. They do this by continuous observation and testing.

If all goes well over time a special kind of resonance, a dialogue, between the two may result. Dialogue is more than discussion, in this case it's a streamlined interaction between the leader and follower where exchanges between the two appears to take place faster than causally expected. Dialogue is possible when ethos and pathos have provided a foundation for trust and when logos provides a path for the free exchange of ideas. As our bonus physicist, David Bohm, pointed out, "dialogue" comes from the Greek "through logos" or "through meaning".

While we can all see pretty clearly what's happening in our own inertial frame of reference, we have a much harder time seeing what's going on in another. But our outsider observer can see indications that the leader's three dimensions of change are fulfilled by the success of the organization and they can see indications that the follower's needs are also met by the retention level of the employees and their willingness to allow the leader to remain one.

After all, true leadership is a transitory position, no willing followers, no leader.

### Three by Three

There you have it: Three different inertial frames of reference. Three dimensions in each frame. Each describing the world as seen by the leader, the follower and the relationship between the other two. *The Three by Three*.

THE LEADER	THE FOLLOWERS	THE RELATIONSHIP
What to Change?	Who are we?	Ethos
What to Change to?	Where are we going?	Pathos
How to make the Change?	Who can get us there safely?	Logos

Each person "lives" in their own inertial frame of reference with their own consistent laws, but all three of our inertial frames exist at once. And when the properties of all three dimensions are simultaneously strong for the leader and the followers as well as the interaction between the two, a miracle can occur. Or at least a breakthrough project, outstanding fiscal year or amazing career since physicists aren't allowed to use the "M" word.

Michael Clingan has an MS in physics and a bachelor's in English literature. He has over 25 years of experience as a speaker, trainer and consultant, as the Chancellor of the acclaimed C-bridge Institute on the MIT campus and as VP of three international firms. He lives in Colorado.