

Alexandra Magold

Good morning science, my name is Alexandra Magold. In my previous episodes, I've shown you enthusiastic people, but obviously motivation is not a genetic trait. There are things we can do about it. And the perfect person that I can think of to explain this is the author of a landmark paper on scientific leadership, as well as of a phenomenal TED talk. His name is Professor Uri Alon from the Weizmann Institute.

Prof. Uri Alon

When I think it was, the hardest years of my life, was when I became a P.I. and I found out I had no clue what to do in my new job. You know I had trained to be, to do science. Now, I had to help people go into the unknown. But in scientific education, I got very little clues on how to do that. So I made some really basic mistakes, like when I was interviewing. So I would just talk, talk, talk and not listen.

And then I was just explaining how great my lab is and stuff, and so then didn't figure out who the people were that I'm talking to. And then I hired some people that weren't a good match for me and for each other and then took me two years to get enough courage to fire because I didn't have it. (Thinking) am I doing the right thing - right or not? Which actually created a lot of problems for my mentees and so on. And how to say no to invitations, like where you don't want to go somewhere, let's say people invite you too much, so I found myself traveling too much so I got sick.

That kind of opened my eyes to how in science we don't learn about the shaq is actually one of the most emotional professions in the world. We depend on working with people and people's motivation and people's particularities. What is it that their world view is and what makes them wonder about nature instead of ... So the better I think we are at communicating and dealing with people the better scientists we are, because if you give people the opportunity to reach their full potential as scientists, they do the best science that they can.

So one thing I discovered this was reading some literature from psychology is to demystify this idea of motivation. Motivation - what I mean by motivation, intrinsic motivation, we can't wait to come work here. You have like light in your eyes. Time flows differently. You spend time thinking about it. You become creative. You find self-expression. Every moment feels like you're born to do this. These moments, I think - are precious to us in our career and also we want to see them and people we work with.

But how? How to do it - is really not discussed in science. Sometimes you hear a sentence that say that person has motivation, that person doesn't, as if it's a genetic trait. Whereas, in fact, there are a lot of things that we can do as mentors and also when when we're leading, when we're not in charge or students. Because research in psychology demystified what it takes to have intrinsic motivation, it's not a mystery. If you think backward (to) moments in your life when you had high, high motivation and what was going on there, you'll see that there are three essential vitamins.

If you don't have them, you can't have intrinsic motivation. And researchers discovered this, by the way, by letting people play really interesting puzzles. And one group gets a dollar for each puzzle they solve and the other group doesn't. And then in the break, it turned out the people who weren't paid actually keep on playing with the puzzle intrinsically motivated. So money can be a demotivating factor, actually. What is motivating is these three essential vitamins, one is a belief in competence.

So if you believe that you have some control over what you're doing. It doesn't mean that you have control, this is your belief. So you might actually be competent but not believe it, then you can have motivation. And as a mentor, for example, the first project I gave to my first PhD student was way too difficult. Take this 96 well plate parameter and rewire it to measure temperature and bacterial growth is a function of frequency and stuff, that seems doable to me as coming from my PostDoc but for him it was impossible because he never even grew bacterial colonies, which is the basic thing.

And within two weeks his motivation plummeted. So I kind of backtracked instead of going, why don't you make some bacterial colonies in a petri dish. And then I said: "Good, you did it!" And "Now let's measure their growth rate. Great. You did it. What's the error? Let's do it again." So it could give positive feedback and kind of build a scale of increasing complexity so the person has a feeling of competence could be somewhere between easy and impossible. That's where maximal flow and feeling of I was born to do this lies.

And that's a moving window so you have to listen all the time all with things where they are according to the skill sets, competence, that's vitamin number one. Vitamin number two is called autonomy, which means the project flows from me. I own the project. I am an origin. I'm not a pawn. Now as a mentor, sometimes it's kind of a paradox. You need to sometimes you determine, especially in the beginning, a lot of what the project is. So how can a person own it?

So I discovered a lot of times there is this co-creation of a project, we talk with students and then the next week I come back and they forgot everything I said and say it again. And then one week they come back and they say: "Look, I have this great idea!" And now it's the project I discussed but "Great, what a great idea". And then they own it. Of course they do the same to me. Right. My great ideas sometimes come from them.

But the thing is, is that considering giving people choices inside the project and also listening to who the person is and so the choice of the project is closer to their values and what they believe in and allowing people to try to determine to explain their own project and also maybe to have a side project which is totally their own, where they can go. All, these are ideas on how to create autonomy, and there's also ways to ruin autonomy, like micromanagement. You care so much how the project is going to do that you over manage and that ruins autonomy. So I'm saying that, of course, I've made all these mistakes as well, a mentor can ruin these vitamins or provide it.

So we said competence, the belief that you have some control. Autonomy, the project stems from me. And the third one is human beings are social - social creatures. So this is called social relatedness. We

need to feel part of a community and we need to have somebody we care about, care about our project. So it's impossible to do science in isolation. We do a lot of science on our own, but you can't do it in isolation.

And that means that one of your tasks is to find the person that on a daily basis you can talk, listen, talk. And that cares, it could be the mentor. It could be someone else. Without it, you can't have intrinsic motivation. And also, if you remember the feeling where you go to a meeting and you present a poster and somebody feels that, oh, somebody else cares about my project, I am not alone in the universe, it's extremely motivating.

So sending students to even a local meeting, you know, to present, can be transformative. My group meetings, for example, I designed for social relatedness in the first half hour. We just we kind of waste it. We don't do science, but we do something very precious. We talk about whatever is going on what movies we've seen, hobbies, volunteering whatever and we laugh a lot. There is a lot of laughing, eating, and then when we do the science part.

You get questions and comments in a way that's very constructive, with a lot of softness, a lot of listening and a willingness to bring each other forth, you can say so that investment in social relatedness trips etc. - letting people teach something, when they are new in the group. Is the key to getting a group that is more fun to be in and also since the group as STEM people we know we have n people in the group there's about n^2 pairs and minus one over two.

So if you have 10 people who have forty five pairs and some of them contribute 10 percent each month to the research, you have forty five, 4.5 times more research if you can get those pair interactions to contribute. I hope I was clear. So that's why. And if we take into account the, you know, the subjective and emotional aspects of human beings in science, we can end up improving our bottom line, our objective, rational quality to bottom line and also it's a value thing what kind of group would I like to be in.

For me, it's extremely satisfying to see two students helping each other. And then I do something which is just like parenting. It is praise that slightly specifically when people get that of value in our group, even people with sharp elbows. You know, they behave slightly differently because of the vibe of the group that I take care to form, and that makes life in the group, in a research group just worth living.

Alexandra Magold

Do you feel like the students or former postdocs that leave your group and start their own labs, do you feel that they're mirroring your leadership style?

Prof. Uri Alon

Yeah, and I think they also developed their own, but what I can say is a lot of them become change agents and try to improve the culture of science wherever they are. For example, Galit Lahav is now head

of systems biology at Harvard Medical School and won the mentoring prize. And she set up the workshops on active listening for PIs and for women in science, and she's really making sure there's training and communication skills and she's incredible at Harvard Medical School, you know, transforming the culture there.

And the student in Israel is the doing all kind of projects inside academia, making sure the university sponsors, if you want to go to a Psychotherapist's or to a professional coach, so if you can get that extra support as a PI, you know, you go through so many emotional interactions without necessarily having a space for yourself to reflect on them. So just to have the university sponsor, that is also a statement again, that we're human beings, we're not robots. We need other people who are helping professions to support us and that our job is so critical because we deal with precious lives of very talented students and colleagues.

We spend millions of dollars on our technology. Why not? Make sure that just like. If you buy a microscope, you have the best optical table to work that the person gets the best chance to get the emotional and spiritual support they need. So that's huge, I think. That he thought of that and spearheaded and got through. And I think that and being in my group just suggests to people the possibility of being a change agent to discover what they want to do.

Right. And of course, I learned from others like Evelyn Fox-Keller and what they meant to me and from my mentors. So I admire some people who are changing things and there's so much to do. And I think academia is actually kind of more easy case for cultural transformation because scientists are at the core. A lot of us are people who are conscientious would like to see the world improve and also very good with concepts like communication and teaching.

Alexandra Magold

Thank you so much for talking to me.