The True Nature of Placebos

Dr. Alia Crum: [Speaker standing on stage in front of audience] So today I’m going to talk about how our mindsets matter in virtually every facet of our lives, but I want to begin by telling a story about a group of researchers in Italy. Dr. Fabrizio Benedetti and his colleagues studied a group of patients undergoing thoracic surgery. Now what you should know about thoracic surgery is that it’s a very invasive procedure. Patients are put under anesthesia while the surgeons make major incisions into the muscles of the sides and the back in order to gain access to their heart and to their lungs. Now about an hour after the anesthesia fades away, the pain starts to set in. Fortunately, patients are given strong doses of morphine sulfate, a powerful pain killer. This is routine treatment for thoracic surgery, but Dr. Benedetti and his colleagues made a few subtle tweaks. Half of the patients were given the dose of morphine by a doctor at their bedside. [Image appears of a cartoon patient laying in bed with a doctor administering morphine]. The other half was given the exact same dose of morphine, but it was administered into their IV by a pre-programmed pump. [Brief image of same patient connected to a computer pump].

Now you would think that both of these groups of patients would experience the same relief, but this was not the case. The group that received the morphine by the doctor reported significant reductions in their pain levels. [A chart graphing pain levels appears indicating within 60 minutes, pain decreased from 8 to 4 with morphine.] The other group, the group who receive the exact same amount of morphine but wasn’t aware of it, they didn’t seem to experience the same benefit. [On the chart, users who received morphine via a pump reported an average pain level of only six.] Dr. Benedetti and his colleagues didn’t stop there. They used the same procedure to test the effectiveness of other treatments—treatments for anxiety, treatments for Parkinson’s disease, treatments for hypertension—and what they found was remarkable and consistent. When the patients were aware of the treatment and expected to receive the benefit, the treatment was highly effective. [A chart maps effectiveness of improvement for anxiety at 25%, Parkinson’s at 15%, and hypertension at 15%.] But when they weren’t, that same drug, that same pill, and that same procedure was blunted and in some cases not even effective at
all. [Comparatively, the chart shows with a hidden, computerized pump injection, the effectiveness of treatment less than 5% for anxiety and Parkinson's and just a little over 5% for hypertension.

So, I read about these studies when I was a student at Harvard University, and at the time I was heavily immersed into the literature on the placebo effect. The more I read, the more I started thinking about the true nature of placebos. So what is the placebo effect, really? Well, most people discount the placebo effect as just some magical response to some fake pill or some faux procedure, but that’s not what the placebo effect is. The placebo effect is not about the faux pill or the sugar pill or the fake procedure. What the placebo effect really is is a powerful, robust, and consistent demonstration of the ability of our mindsets—in this case the expectation to heal—to recruit healing properties in the body. So what is a mindset? A mindset is quite literally a setting of the mind. It’s a lens or a frame of mind through which we view the world; we simplify the infinite number of potential interpretations at any given moment. [A human head with the outline of the brain appears on the screen and the definition of mindset: a lens or frame of mind which orients an individual to a particular set of associations and expectations.]

Now, the ability to simplify our world through our mindsets is a natural part of being human, but what I want to suggest to you today is that these mindsets are not inconsequential and instead they play a dramatic role in determining our health and our wellbeing.

**Exercise is just a Placebo?**

While I was at Harvard, I had the opportunity to work with professor Ellen Langer. She’s a professor, a psychologist, and when she heard that I was also a division I athlete, laughed at me. She said “You know exercise is just a placebo, right?” [laughter from audience] Now I was kind of offended because at the time I had been spending up to four hours a day training my body to be in optimal shape, but she did get me thinking about mindsets and how they might matter outside of medical walls. Was I getting fitter and stronger because of the time and energy that I was putting into my training, or what I getting fitter and stronger because I believed that I would? What about the other extreme? What if people were getting an extraordinary amount of exercise, but weren’t aware of it, would they not receive the same benefit?

We decided to test this, and to test this we found a really unique group of women: a group of 84 hotel housekeepers working in seven different [Image of woman changing a hotel bed, vacuuming a floor, and cleaning a sink.] across the U.S. So these women are on their feet all day long. They’re using a variety of muscles and they’re burning an extraordinary amount of calories just doing their job, but what’s interesting is that these women don’t seem to view their work in
this light. We asked them, “Do you exercise regularly?” and two-thirds said NO. So we said, “Ok, well, so on a scale of zero to ten, how much exercise do you get?” and a third of them said “Zero. I get no exercise at all.” So we wondered what would happen if we could change their mindset. So we took these women, we split them into two groups. We measured them on a variety of things including their weight, their blood pressure, their body fat, their satisfaction with their job, and then we took half of them and we gave them a simple 15-minute presentation. We gave them this poster and we said, “You know, your work is good exercise. It satisfies the Surgeon General’s requirements, which are quite simply to accumulate about 30 minutes of physical activity. You should expect to receive those benefits.” 15 Minutes. [A copy of the handout of the poster they provided appears on the screen behind the presenter. The poster's header states "Did you know your work is good exercise!" and provides a calorie breakdown of work activities, such as vacuuming (50 calories for 15 minutes), changing linens (40 calories for 15 minutes), and cleaning bathrooms (60 calories for 15 minutes).

We came back four weeks later and we measured them again. Not surprisingly the group that didn’t receive this information didn’t change, but those that did, looked different. [Four charts reporting weight, systolic blood pressure, body fat %, and job satisfaction, all with relatively little change who did not receive the information.] They dropped weight. [The chart indicates around a 3 lb weight loss.] They had a significant reduction in systolic blood pressure. [The chart indicates over a 8 point drop.] They dropped body fat and they reported liking their job more. So, what does this tell us? To me it was fascinating. Just as a result of a simple 15-minute presentation, the whole game changed producing a cascade of effects on both their health and their wellbeing, presumably without even changing behavior.

Now some of you might be thinking, “Well how do you know they didn’t change their behavior? Right? Because that must have been what produced the effects.” Well, we know they didn’t work any more and the room attendants themselves assured us that they didn’t join the sports club down the street, but of course you can’t know for sure if they weren’t putting a little more oomph into making the beds.

**Our Mindsets and Our Bodies**

So, this question really plagued me. Is there a direct, immediate connection between our mindsets and our bodies? So to test this, I worked with my colleagues at Yale, Kelly Brownell, Will Corbin, and Peter Salovey, and we did so by making a big batch of milkshakes. So we made this big batch of milkshakes and then we invited people to come to our lab to try the milkshakes and in exchange we would give them $75. [Image of the poster Dr. Crum’s research team used to invite people in for their study.] Sounds great, right? Well the less
appealing aspect of the agreement was while they were drinking the shakes, we had them hooked up to an IV so we could get their blood samples.

We were out to measure Ghrelin. Ghrelin is a peptide; it’s secreted in the gut. [A molecular image of ghrelin appears on the screen behind the speaker.] The medical experts call this the “hunger hormone,” so when we haven’t eaten in a while, our Ghrelin levels start to rise, signaling to the brain it’s time to seek out food and slowing our metabolism just in case we don’t find that food. Say we go out and we find and we devour a milkshake, a hamburger, some french-fries, our Ghrelin levels drop, signaling to our brain “time to stop eating” and revving up the metabolism so we can burn the food that was just consumed.

So, the participants came in. We hooked them up to an IV and then we gave them a milkshake: “Sensi-shake.” This is zero percent fat, 140 calories, zero added sugar. This is guilt-free satisfaction. [An image of the Sensi-Shake nutrition label appears on the screen, which focuses on the low fat, low calorie, low guilt nature of this French Vanilla flavored milk shake.] So they drank this shake and in response their Ghrelin levels dropped, but only very slightly, signaling to the brain that some food had been consumed but not a whole lot. [A chart labeled "Drop in Ghrelin" indicates the drop was only slight to about -20.] So a week later, they came back to our lab, we hooked them up to an IV again, and we gave them this shake: “Indulgence.” 620 calories, 30 grams of fat, 56 grams of sugar. [Nutrition label for "Indulgence," detracts from the nutrition and focuses more on the smooth, rich and delicious taste of this shake. Now this, this is decadence you deserve. In response to this shake, their Ghrelin levels dropped again, but this time at a significantly steeper rate—about three times more than the shake they had before. Now this would make good sense to any metabolic nutritionist who understands that the drop in Ghrelin is proportional to the amount of calories consumed. But there was a catch. In this study, even though the participants thought they had consumed the sensible shake and the indulgent shake, in reality we had given them the exact same shake at both time points. [The same chart indicates their Ghrelin levels drop to about -70.]

So, what does this tell us? Well, just as in the case when the same amount of morphine produced more or less of an effect depending on our awareness, and just as in the case when the same amount of exercise produced more or less of a benefit depending on how it was construed, here again our mindsets proved to matter. In this case suggesting it might not be just calories in and calories out or the precise makeup of fats and nutrients, but what we believe and what we expect and what we think about the foods we eat determines our body’s response.

So in light of this, it behooves us to consider our own lives. What are our mindsets and how might we begin to shift them, to alter them, to have them be more
beneficial? So take stress, for example. What’s your mindset about stress? If you’re like most people, you have the mindset that stress is bad, bad, bad, bad. Bad stress! Now this is not surprising considering that everywhere we look there’s warnings, labels, yelling at us, reminding us about the negative effects of stress. [Two Time Magazine covers about stress and research quotes popping up: "A growing plague," Blythe, 1973; "An epidemic," Wallis et al., 1983; "Stress is linked to the six leading causes of death (heart disease, accidents, cancer, liver disease, lung ailments, suicide) – American Institute of Stress] But the truth of stress is not so clear-cut, and in fact there is robust and growing body of research showing that stress can have positive effects, enhancing effects on our health, our wellbeing, and our performance.

**Our Mindsets About Stress**

Now, I’m not here to try to persuade you that the effects of stress are enhancing, but rather to point out the at the truth of stress is like most things in life and that is it’s uncertain, and therefore to raise the question “Do our mindsets about stress determine our response?”

**Mindset Employee Study**

So, to test this question, I worked with Shawn Achor and Peter Salovey, and we worked with a group of 300 employees. This was after the 2008 financial collapse and we decided they were stressed. They had just heard that 10% of their workforce was going to be laid off and they were overworked. So we decided to see if we could change their mindsets and we did so by having them watch simple video clips. I’m going to show them to you here simultaneously. Half of the participants saw the one on the left, half the one on the right.

[Description of video: Two videos playing simultaneously, side-by-side with music in the background. The left side video has a title over it that reads "Stress is debilitating" and the video text reads, “Many people think that stress is necessary to remain productive and successful, but in reality even the smallest amount of stress can hinder performance.

The stress response pumps adrenaline throughout your body. This response is designed to prepare your body for physical action. But it can hijack your rational mind and diminish your ability to think clearly. The stress response can deteriorate your focus, decision-making, drive, performance. Consider the following examples: Athletes seem to crumble in the most critical moments, skilled professionals tend to make their gravest errors when under stress, mental fatigue and distress made physicians significantly more likely to make major medical errors."

The right side video has a title over it that reads, “Stress is enhancing” and the video text reads, “Most people assume that in order to perform at the highest
level, you need to be calm and free of stress, but in reality, it is pressure that fuels peak performance. The stress response pumps adrenaline throughout your body, fueling the brain and body with blood and oxygen, increasing energy and heightening alertness. This stress response is deigned to enhance your: focus, decision making, drive, performance. Consider the following examples: The most impressive sports plays happen in the most heated moments’ Video cut off by speaker]

Dr. Alia Crum: So you get the point, yes? So here we are, in the dark [Laughter from audience; lights come back on] So here we are. They’re watching facts, research, anecdotes. All true but oriented towards one view or the other. What we found was interesting: those who watched these simple, three-minute video clips before the bell rang, before their job began, over the course of the next few weeks reported fewer negative health symptoms, fewer back aches, less muscle tension, less insomnia. [A graph indicating that those watching the enhancing video reporting a drop from 7.7 to 7.0 in reported negative health symptoms compared to no drop in symptoms from those watching the deteriorating group. They also reported a higher level of engagement and performance at work. [A graph indicating an increase from about 2.5 to 2.7 in work performance for those watching the enhancing video, compared to relatively no change fro the group watching the deteriorating video.]

So, at this point, I’ve presented four studies—four studies that demonstrate the power of mindset in medicine, in exercise, in diet, and in stress. There are many other very talented scholars tackling these phenomena as we speak. Carol Dweck’s research demonstrates that if we can shift our mindset about intelligence and talent as something that’s fixed to something that’s changeable over time, it can dramatically alter our academic and professional success. Yale epidemiologist, Becca Levy’s research shows us that if we can change our mindset about aging from viewing aging as an inevitable process of deterioration to a process of gaining wisdom, gaining growth, not only shapes the course of how we grow old but even extends longevity. Ted Kaptchuk and his group at Harvard’s Program for Placebo Studies is doing cutting edge work understanding how we can begin to harness and ethically utilize the placebo effect in clinical practice. So, though the context is different, the message is the same: our mindsets matter. Now, don’t get me wrong. I’m not saying that medicine doesn’t work or that there are no benefits of exercise or that what we eat doesn’t matter. It does! But the psychological and physiological effect of anything in our lives can and is influence by our mindset. So, is the power of mindset limitless? Probably not, but what I hope I’ve done for you today is inspired you to reconsider where those limits really are, because the true task ahead is to begin reclaiming this power for ourselves, to acknowledge the power of mindset, and know that just like this, in just the blink of an eye, we can
change the game of any facet of our life quite simply by changing our mindset. Thank you.