

Emotions and Tech: What Happens When We Code Our Inner Lives?

Rana el K: Good afternoon everyone. I'm gonna, I'll call UBM Efik t Vesco founder and CEO, uh, affective as at MIT spinoff and we are on a mission to humanize technology. Um, my journey started, um, over 20 years ago where I, I grew up in the Middle East. I was born in Cairo and then we moved around in the Middle East and then I had the opportunity to move to Cambridge University to do my phd in computer science, specifically in machine learning. And I get to Cambridge and I realized I was spending more time with my device at the time than I did with any other human being. I know it's kind of sad, right? But I don't think I'm the only one. Um, but it made me realize two things first, that this device had absolutely no clue how I was feeling most of the time. It knew a lot of things about me and you'd, my location, what activity I was doing.

Rana el K: Um, it knew it, knew who I was, but it was completely oblivious to how I was, uh, feeling my emotional state. The second kind of Aha moment I had was that this device was my main portal of communication with my family back home. And oftentimes I would be really homesick. I would be stressed and upset and the best I could do was send a little Emoji with like tears, you know, over chats. And I felt that all of the richness of our nonverbal communication and the nuances of our emotional experiences totally got lost in cyberspace. So that got set me on a journey to build computers that have empathy and have emotional intelligence. Um, and you know, after Cambridge I joined MIT media lab as a research scientist, quickly realized that there were a lot of commercial applications of the technology. And so we spun out today, AI is ingrained in every aspect of our lives.

Rana el K: It's becoming mainstream and it's actually taking on roles that were traditionally done by humans acting as your personal assistant, helping with your healthcare, driving your cars, helping you hire your next coworker. The problem is we need this new social contract that defines our relationship with technology. One that is built in my opinion on mutual trust. If you think about the rhetoric around AI, it's all about should we trust in this AI. I encourage you to kind of flip it on its head. Should AI trust in humans? It's not that we always have the track record of doing the right thing. If you think about what's going on, like trust has already gone wrong in many cases. You know, chatbots that have turned racist on Twitter, overnight of self driving cars that are being involved in fatal accidents and facial recognition technology that discriminates against minority groups, especially women of color.

Rana el K: So trust is a social contract. Sometimes it's explicit like we need all these terms and conditions and license agreements. But actually most times it's implicit. It's manifested on the nonverbal communication and empathy. Empathy is right at the center of building trust. It's one of the themes that I'm hearing over and over, um, at ideas festival. Um, and I really believe in that. But if you look at

technology, we're very focused on the cognitive intelligence of these devices, the IQ, and nobody's really thinking about the EEQ. And we know from years of research that your emotional intelligence matters. People who have higher EQT tend to do better in life. They're more successful, they're more trustworthy, they're more likable, they're more persuasive. And I believe that that's fundamentally true for technology as well for technology that integrates and communicates with humans on a daily basis. So that set me on a journey to build technology that can read human emotions, um, just as humans can. What if our computers could tell the difference between a smile and a smirk? Um, they both involve the lower half of the face but have very different meanings.

Rana el K: Imagine if you're learning apps, intelligent learning systems could understand or gauge the emotional engagement of the learner and personalize the content accordingly. When you walk into a doctor's office today, you don't get asked what's your temperature or what's your blood pressure? We measure it. But in mental health, the gold standard is still soft report. On a scale from one to 10, how depressed are you? How suicidal are you? How much pain are you in? And I believe I'm very passionate about this, that it's time that we bring in objective data, longitudinal objective data that can help us quantify mental health and interfere and kind of help early on. So that's one of the use cases of this technology. But really the merger of this IQ and EEQ in technology is inevitable and there are so many applications of this technology, um, which makes it kind of interesting for a young startup like us to kind of really prioritize the different applications.

Rana el K: But then how do you build a computer that can read these dips, displays of emotions, people communicate in a variety of ways. You use gestures, you use vocal intonations. And of course we use our face. The face is one of the most powerful canvases of communicating a wide range of emotional and cognitive states. Um, over 200 years ago, this guy called Duchesne, used to electrically stimulate people's expressions to or facial muscles to study expressions. We do not do that anymore, thankfully. Um, and then in the 1970s, a researcher, uh, called Paul Ekman and his team published the facial action coding system. It is a methodology to map every facial muscle to an action, to a code. So for example, if you pull the zygomatic muscle as in smiling, you should all try it. Um, that's action unit 12. If you do a brow Farro, that's actually unit four.

Rana el K: Um, there's about 40 of these action units. It takes you about a hundred hours of training to become a certified face coder and then about five minutes to every minute of video to code, um, to code a video. So you essentially watched the videos in slow motion. You say, oh, I see a smile, I submit a smirk. Very, very time intensive. So what we've done is we use computer vision and machine learning to automate this process of face reading. And I thought it would be fun to try a live demo. Um, so always, always interesting. Um, but I need a volunteer with a face, somebody with a face. So who would like to try this? I am not going to be tweeting. Okay, awesome. We have a volunteer. Yeah. Yeah. Thank you. Thank you. Alright, come on up. And can we switch to the iPad please?

Speaker 2: Alright.

Rana el K: So I'm just using the camera on the iPad. I'm not recording any of this video on the device. I'm not sending it to the cloud. No, no. You can come over. We're going to do this live. Yes. Alright. You hold onto the iPads.

Speaker 2: Okay.

Rana el K: Lori? Yes. Okay. Hi Lori. All right. Um, okay. Start with your best poker face. All right, great. Keep it. It's tough. I know. I'm so, you can see that the technology has immediately identified Lori's face. It's also identified the main feature points on your face, your eyebrows, your eyes, your mouth, and based on how you look, it's maps your gender to female. Um, that's good. You never know. So I have to be very careful how I say that. All right. So, um, and you're, you're, you're smiling and it's detecting your expression of, you know, it's mapping your smile to, to joy. We're going to debate that, I assume on the panel. Um, but let's, let's try, let's try these. So eyebrow raise. That's great. It's awesome. Mapping Lori's most dominant expression to an Emoji. How about Brow Farro? Oops, sorry. Yeah, there you go. SMIRK. So a smirk is an asymmetric lip corner pull. So there you go. Yeah. There nails wrinkle. Yeah. You're also wrinkling your nose a little bit too. Um, and then lip pucker just for fun, which is the Kardashians duck face. Yep. There you go. Great. There's about 20 of these different expressions that we are able to detect. We're only showing six for simplicity, but thank you. Thank you.

Speaker 2: [inaudible] let me put that in all the way back.

Rana el K: This app is just to kind of bring to life the technology and hopefully your minds are already thinking of some of the use cases and applications. Can we switch back to the slides, please?

Speaker 2: Okay.

Rana el K: Um, this, this app is available in the apps store and you can download it and play with it if you're interested and try to break it too. Um, so the way we train these algorithms is we inject hundreds of thousands of examples of different expressions, smiles, smirks, eyebrow raises, et Cetera. And using deep learning, the neural network actually looks for patterns of commonality between each expression and it learns these different emotions or different expressions of emotions. When we first started, um, we were able to only identify three of these, you know, smile, eyebrow, raised, brow, Farro. We now have over 20 different facial expressions, seven emotional states, things like cognitive states like attention, fatigue, distraction. Um, and we're continuously adding to the repertoire of expressions so that the technology can detect, uh, we've amassed a ton of data through this exercise and very interesting insights that maybe we can talk about in the panel on what we've learned from this data.

Rana el K: So we've have 8 million faces in our database of people emoting across the world. It's a very diverse data set, which brings me to one of the main concerns I have about the kind of the development of these AI technologies. And, and I'm not concerned that robots are going to take over the world. I, but I am very concerned about accidentally building bias into these technologies. Um, we've already seen, you know, these facial recognition technologies being very biased against certain groups. And the way to think about this is if the data's biased, the algorithm is going to be biased too. So we take a very mindful approach in sampling for diversity when we're training the algorithms. So here you're seeing how the smile classifiers being trained, there's equal, um, kind of, you know, equal samples of females and males or they're not exactly equal. It's very hard to exactly balance the Dataset. And then there's some representation of different ethnic groups. And when we look at the accuracy of these classifiers, it's the same thing. We look, we don't just look at a general accuracy number, we break it down by gender, ethnicity, age, et cetera.

Rana el K: And I want to take this opportunity to kind of put, put a plug in for the diversity, the importance of diversity and people who are designing these AI algorithms. Um, our team is very diverse, not just age and gender and ethnicity, but also backgrounds and experiences. So we don't just have data scientists and machine learning, machine learning scientists, the, I know it's hard. Sure. You're like, I'm like exercising. Um, um, but diversity is very important. So diversity of experiences too. So we have psychologists and um, artists, art historians on our team who are also kind of lending their perspective on how we think about these algorithms. So where is this technology being used? There is a lot of applications. As I said, already, 25% of the fortune global 500 companies use this, um, day in, day out to test how people emotionally engaged with their content.

Rana el K: Um, and it's done. It's very scalable. So you might get a survey on your phone, it asks you to turn the camera on. If you say yes, camera turns on, you watch, you know, a Netflix show or a, you know, a Coca Cola ad and we're like looking for your subconscious visceral emotional reactions. And we found that this data correlates very highly with consumer behavior, like my reality or do you actually buy the product or not? Um, this is also being used in hiring. That's a whole other conversation to reduce bias. People are very biased when they're hiring because it's very hard to decouple, um, kind of our implicit biases around, um, yeah, you know, race and gender, whereas the technology is both gender and ethnically blind. And so there was a huge study that one of our partners higher view did with Unilever that use this technology and they found that they were able to increase the diversity of their hired population by 16%.

Rana el K: Um, you could also use the same data to help people improve their interviewing and negotiation skills and management skills just to be more empathetic, um, or public speaking. So you could practice with this machine, right? That's not judgemental and patient. Um, and it could say things like, oh, like you've said, ohm, ohm, ohm a hundred times or you're not making enough face contact and

you can track how you're doing better over time. One of the really kind of interesting and fascinating use cases of this technology is an automotive. So we're partnering with a number of companies to bring this to our cars. And I want to show you a couple of examples of data we've collected from drivers with their consent. So they know that there's a camera in the vehicle and this is what we got.

Rana el K: So this is a dad driving the technology is actually tracking both him and his daughter. He's clearly asleep. Um, this video goes on for a good five to seven minutes and it's extreme drowsiness, very easy to detect just by looking at the blinking behavior in the head pose. Um, you could imagine how the car can intervene. Um, you know, over time the car can actually take control over and say, you know what, I'm going to be a safer driver than you are right now. I'm taking the, you know, control over it. But there's a variety of things the car can do. Here's another example. Again, these are people who know that there's a camera in the vehicle.

Rana el K: So again, extreme example of distraction. So her eyes are off the road, her hands are off the wheel. Using a combination of computer vision, but also object detection to determine that, that she's two phones in her hand. Again, the car can intervene and, and um, s you know, give alert or escalate, um, action. So we're doing a lot of work in that space. We're also partnering with robotic companies to bring this technology to mental health. As I said, it's an area I'm very passionate about. Um, and, and there's a lot of use cases there. One of the very early applications we, yeah. Explored for this technology was autism. Eight year old Matthew Krieger has been diagnosed with autism. A lot of the trouble he gets into other kids is he thinks it's funny and doesn't read at all that he's not, or that they're annoyed or angry. Matthew's mother, Laura signed him up for a clinical trial being conducted by Ned. So here I want to know what's going on inside the brain of someone with autism. And it turns out parents want to know that too.

Speaker 3: Excellent. You get points for looking for awhile and then even for looking away and then looking back,

Rana el K: so he, his company, brainpower uses athletic ethic, Tiva software in programs Matthew sees through Google glass. These games are trying to help him understand how facial expressions correspond to emotions and learn social cues. One of the key life skills is understanding the emotions of others. And another is looking in their direction when they're speaking,

Speaker 3: looking at your mom and while it's green, you're getting points. When it starts to get an orange and red years, you'll slow down with the points. And I'm looking at you,

Rana el K: you are looking at just a few minutes later, the difference in Matthew's gaze overwhelmed his mother relative cry. Why?

Speaker 4: Yeah,

Rana el K: Bruce Bunny, look at me.

Speaker 4: Cool.

Rana el K: They asked me, they haven't really before because you're looking at me differently.

Speaker 4: Oh.

Rana el K: So our partner, brainpower, they have about 350 of these Google glasses deployed with families. We already know that the kids, while they're wearing the glasses, we can see an improvement in their eye contact and face contact and understanding these basic kind of expressions. Um, the big question is once we take away the glasses, are they generalizing these skills or not? So that's one of the questions that they are, um, kind of exploring. So, hopefully by now you're thinking of a lot of applications. Some of them have potential transformative potential for humanity, but some are probably freaking you out. Um, so we think a lot about this ethical deployment of AI. What kind of industries do we entertain, not just as a company, but as a, as a community and thought, thought leaders in this space. We have very strong core values where we have turned, you know, over \$40 million of funding, um, to take this technology to surveillance and security and lie detection. Um, I feel like it would break the trust we've built with, with our consumers and our users. Um, so, so that's something we feel very strongly about and I feel very strongly that we as a community need to get together and decide what are the rules of engagement and what are the rules for ethically developing and deploying this technology. And so I'll just leave you with a thought. Let's make AI not about the artificial, but about, you know, the human needs and how it can serve us.

Adrienne L: Um, great. Thank you so much. So if you wanna take a seat, I do have water for you. Um, and we'll, we'll bring up some of the other panelists shortly. Uh, I guess I want to start, I do want to go back to the, the question of bias because that's a really rich topic in this field right now. But before that, a more general question, which is how do we figure out how to think about this kind of technology and how on one hand you see like if there's a way to prevent distracted driving, if there's a way to help an autistic child understand how to be successful in the world, those feel like objectively good things when it's a Coca-Cola, a smart TV, watching my face react to a Coca-Cola ad and then telling coke, I, I become a little more creeped out. So how do you think about the applications and where we as a society should feel comfortable or not?

Rana el K: Yeah, absolutely. I am a big believer. Everything of course has to be done with people's consent. And I think people ought to like own their data. But I don't think that's enough. There has to be some value in it for you as a consumer who's going to share this very, very personal data. I mean, it doesn't get more

personal than your emotional data. Um, so in the, in the advertising use case, we pay people like we, you know, we, we compensate people for sharing this type of data and that's totally fine. You know, some, you know, a lot of people opt in to do that with the driving. The value proposition is that this will be a safer for you and your family. Um, but there always has to be a value proposition back to that person. And I don't think we've, as a tech industry, we've always gotten that cost value equation. Right?

Adrienne L: Right. And humans generally, excuse me, tend to be quite good at reading sort of discreet facial cues. And it's, I'm hoping you can talk a little bit more about the mapping, um, and sort of the nuances. I mean, certainly there are more emotional states than can be reflected in however many emojis there are. Um, and, and there is a difference in how one person might express joy to the next. I mean the joker smiles and that doesn't mean he's happy. It means he's crazy. Super Villain. So how do you look at sort of the, the, the range or the spectrum of, of human emotion and how it's conveyed and how to interpret it if it's a machine? Um, sort of running the show?

Rana el K: Yeah, a couple of things. First of all, I want to clarify, we're not like reading your inner most feelings, right? We are like reading outward displays of, of emotion, of outward, outward displays of behavior, right? These could be social signals for communicative purposes or they could be truly reflecting your interstate. Um, you know, sometimes that's the case, sometimes that's not the case, but we're very interested in this human behavior, these outward signals that we choose to portray, um, because they, they carry a lot of meaning. Um, and then, you know, the mapping back to the emotions, that's a very challenging problem. I mean, humans don't always get it right. And we amass a lot of information. Like we, you know, we consider multiple modalities. We listened to the people's vocal intonations, we watched their expressions. Often you, um, borrow information from, you know, if you know that person, if you've known the person for many years, you have a lot more contacts, tool information to draw on as well. Um, so I would say the technology is very, it's, it's, it's in its early days. We have a long way to go.

Adrienne L: I know you mentioned when our a volunteer came up for the demo. Thank you again for that. Um, that you asked her to do her best poker face. Have you tried to apply this technology to like the most inscrutable populations of people like, uh, poker players?

Rana el K: We've been, we've been approached by the gaming industry, but we've not, we, yeah, we, we have not applied it to poker players.

Adrienne L: What are some of the other most sort of inscrutable, uh, facial expressions or, or the ones that sort of bleed into one another and maybe surprising ways?

Rana el K: Um, I mean, we do a lot of testing. This is not exactly an answer to question, but we do a lot of testing in Hollywood and there is a disproportionate amount of

botox and our technology does not work if your muscles can't activate. So, um, so that, that, I mean, that's, that's, that's a challenge. Um,

Adrienne L: um, going back to the question of Algorithmic bias, um, I think, and tell me if I'm oversimplifying it, but in as a tech reporter, uh, I covered this as you often and it seemed like there are two kind of main modes of algorithmic bias that people talk about or worry about. One being the models that don't actually reflect reality. So that's a model that you develop that doesn't actually detect, um, it with as much sophistication people with darker skin. I know you mentioned women of color specifically, um, and the other being a model that would bring in the prejudices of the people or the system that built it. So that's the example where you may have read about, um, a hiring algorithm that doesn't suggest hiring or it doesn't recommend hiring women because all of the data has been hiring men more than women. That doesn't mean the women aren't qualified. It just means that the human, um, the humans making the decisions before it weren't necessarily or were bringing their own prejudices. So talk a little bit about, a little bit more about which of those two modes or, or other forms of algorithmic bias are most sort of concerning to are sort of where do you see both? Yeah.

Rana el K: Yeah. Both are very concerning. And um, I mean it's often a blind, it's not done on purpose. It's just done accidentally. Right? Like people are not, or the folks who are designing these systems are not being very mindful about kind of the process of training and building these systems and testing them and validating them. I'll share a couple of examples. So you know, we have about 8 million faces in our data set. Our team of annotators the fee, the certified fax coders, they're based in Cairo, Egypt, where I'm originally from. And a lot of them are women who wear hijabs and you know, they code these videos day in, day out. And one day they all got together and they wrote us in, you know, the row, kind of the Boston headquarters and email and they said, you know, we have seen thousands and thousands of faces and we've never seen any women wearing the hijab.

Rana el K: Now it may or may not influence the algorithm, but it was interesting. We wouldn't have thought of that sitting in Boston. Do you know what I mean? And that's an example of a blind spot. Another example, we work very closely with a German luxury auto maker, luxury auto maker. And we had a proof of concept with them where we're looking at drivers and they were on the hook to collect data and we were on the hook to analyze the data. So we get the data after a couple of months and we go through it and it's, it was collected in Poland and it was all, you know, 30 year old, very, very blonde guys, no women, no diversity whatsoever. And we went back to them and we set a, we could have just analyzed the data, you know, and just, you know, got our money, but we took a stance and we went back to them and we said, you know, you are a global automotive maker. You're going to deploy this around the world. If we just train our algorithms based on this small Dataset of very, very, you know, homogeneous, um, drivers, the algorithm is going to be biased. So we, so we

went back and propose the global strategy to collect data from multiple countries around the world. Um, you know, in a, in a very thoughtful way to mitigate this bias.

Adrienne L: So what about the cases where, you know, we can go back and look at a model that's been trained on all blonde guys, Scandinavia or we can go back and look at how many women were actually hired based on this algorithms recommendations. But what about the things that we don't know to measure that could be informing the way these models make decisions or recommendation?

Rana el K: Yeah, that's, that's why I'm a real huge advocate for diversity and inclusion on these teams. Because we, we just, we solve for the problems we know. Right. Um, and so you want diverse perspectives around the table to say, hmm, have you thought about that issue? You know, and yeah. So I think that that's really critical and we're not there yet.

Adrienne L: Okay, great. We're going to bring up some of our other panelists. Um, Elizabeth Dunn, a professor of psychology at the University of British Columbia as well as Nicholas Epley, the director of the Center for decision research at the University of Chicago's Booth School of business. So, um, thank you both for being here from a moment to get settled. Um, and Elizabeth and Nicholas, we've sort of talked about the realm of, of facial recognition and we're gonna move for a moment into voice, which I know you've both thought a lot about. Um, Liz, maybe we can start with you. Uh, you know, we've seen these machines that can, are these models where a machine can detect, detect happiness on your face, um, but can they, here it is a question that you've been interested in. Can you talk a little bit about what you've learned? Yeah. So we were pretty excited about some of these ideas that are emerging, these claims that you can automatically detect emotion. And so I'm a happiness researcher. My job is to study what makes people happy. And so it will be amazing for me if I could just like automatically know how happy all you are throughout

Adrienne L: your day, that would be great. Um, and so, you know, uh, a really interesting way to do that potentially is because everyone's carrying around smart phones. We can record clips of their voices and then, um, potentially use the really rich information that's contained in the voice to, um, get a pretty good guess. We would hope about how happy they are. So we did this, we got about a hundred thousand, um, voice clips and actual mood measurements. So we asked, ask, found out how people, how happy people really were in that one as this people on phone calls or what kind of did it, we've tried it several different ways. So ranging from someone just saying, this is the sound of my voice today, which is like they're really minimalist and all the way up to somebody talking for a full minute about their day that day. Um, we've, yeah, so we've tried a variety of ways.

Adrienne L: Um, and I can summarize the results succinctly by telling you that we got a big fat nothing there is we found zero predictive power and we had like amazing computer science folks. We had like some of the top emotion people working on this and we just saw nothing. So, you know, there's something we're doing wrong I guess. Um, but we could not find it. Um, and I want to go back, I want to get back to why this might be in the implications, but Nicholas, maybe you can first talk a little bit about your work and, and crews and sort of why human voice is so crucial to our ability to communicate well with one another and just what's your, why is it that humans can rely on voice communication when other realms of communication, which were largely reliant on in this sort of text message, age, voice remains really potent. Um, why is that?

Nicholas Epley: I mean, I think one thing that's important to keep in mind as audience members here is that we're all studying sort of different parts of this social judgment problem. Um, so what you've heard so far is trying to understand people's actual emotional experience from their faces or from their voice. I study the other side of the social interaction, uh, which is the inferences that you make about somebody else when you're in the midst of interacting with them. So the judgments that you make about what somebody might be thinking or feeling or so on. Uh, and we know that people take an awful lot of information from other people's behavior, what they see them see them do. We also know they take a lot from a person's, uh, voice. And so what we do is we study how different mediums of interaction, uh, affect the kind of inferences that you form about somebody else.

Nicholas Epley: I'm most interested in the inferences that you make about somebody's mind or how thoughtful, how intelligent, how rational, like how humanlike they are. And what we find over and over again is that these different media communicate mind very differently. In particular, what we find is that the voice really contains a lot of information that you take about the presence versus absence of another person's mind. When you hear somebody speaking, they sound, we find over and over again more thoughtful, more intelligent, more rational. You can hear them thinking as they're speaking naturalistically we don't necessarily know about accuracy. That's a different, that's a different kind of question. But we know about the inferences that you make when you strip that out in texts. So when you strip the voice out and you're just communicating, uh, with, with texts, we find that people seem less thoughtful, less rational, less intelligent, less mindful. When you strip the voice out of interaction, you also strip out the perception of another person's mind.

Adrienne L: Well then there are nuances too. I mean, I know I've had debates with my colleague about whether ending a text message with a period means you're mad, which is, I mean, such a small thing that, that for many people they're drawing meaning from Nick. Maybe you can talk a little bit about the experiment that you did in 2016.

Nicholas Epley: Yeah, so we ran some, uh, run some ransom experiments just on the eve of the last presidential election, which, uh, I presume most of you will remember the outcome of that one. Um, so what we did was we brought in Trump and Clinton supporters though the weekend before the election on Tuesday, and we had them explain why they were voting for their chosen candidate. As everybody in this room knows the natural tendency these days, uh, not necessarily these days has been going on for awhile, is to sort of dehumanize the people on the other side of the political divide. Not just to think that they think differently than you do, but to question whether they can actually think that is how smart, how intelligent, how competent, how capable of feeling are. The folks on the other side. They seem sort of like idiots to most of us. Um, and so what we did was we had people either type and explanation of why they were voting for their chosen candidate or we had them tell us verbally and we recorded it.

Nicholas Epley: We took an audio tape, uh, audio, video tape. We stripped out the video, we just use the audio or we transcribed it into text. So we now have two media that have voice and two media that don't, we didn't find differences between the media within voice and no voice. And what we did was then we had Clinton and Trump voters watch or read these statements and just judge how human like you are, how sophisticated, how rational, how intelligent, how thoughtful, how emotional capable of emotional experience are you. And what we found was that the tendency to dehumanize the other side mainly emerged when you were reading what the other side had to say. When you actually heard the other side explaining their point of view, they seemed a little more sensible to you seemed a little more rational. Oh these are different support and recognize these are different kinds of judgments than the ones you've heard discuss your so far. These are judgements about your mental capacities and we find that the medium through which people communicate seems to matter a whole lot. Lot of the modern technology that's stripping boys out of interaction, strip some of the humanity out of it as well.

Rana el K: I mean I've, I really believe that a lot of the rhetoric of

Rana el K: the political dialogue we're seeing online and the bullying and all of that is because we do humanizing each other because we're just, you're just sending texts and you don't see how it's being, you know, how it's being, um, what the reaction is on the person on the receiving end. And that's one reason why I believe emotion AI isn't just about like building computers that can interfere, you know, interact with us better. But it's actually about better human to human connections cause we all communicate online. So if Twitter required you to face time with everyone you were tweeting too, we'd all be nicer to each other over great police or at least, you know, you tweet and then, and then, and then you get like a, a score kind of, you know, on the effect you had on people. You upset. Like, I don't know, you upset 10,000 people right now or your current 10,000 people.

Adrienne L: Right. I want to go back to Liz for a minute. Um, your focus on voices I think on voice I think is particularly fascinating at a time when when people are defaulting to texts for communication, online text messages, um, you know, work based chat platforms, whatever the case. Um, and it's also at a time when humans are increasingly getting uncomfortable talking to machines and conversing with machines that don't understand them. Um, what is it about this moment that makes voice sort of, you know, it's, it's diminished in some places of society and then, um, and then we're talking to our machines more than ever,

Elizabeth Dunn: right? Um, well I would say that, uh, you know, there's perhaps an opportunity with these devices that now speak to each other too and that we can speak to, to actually help, help us communicate more effectively. So if there's any like Amazon people in the room, I have this profound desire to be able to set my Alexa so that when my son, six year old son talks to her, it will only work if he says, please Alexa, please get my, you know, because one thing I find really interesting is if you hear kids like talking to Alexa for example, they're often using this tone of voice that I do not like as a pair. And many of these, uh, these voice based systems are defaulted to being female as well, which carries another sort of interesting but very, and so, so we should treat our machines more [inaudible] would say, nope, sorry, not doing that right now.

Elizabeth Dunn: Right? Say that again more politely. So if we can solve this problem. So I'm not 100% convinced that we've solved this prop technical challenge yet of getting machines to accurately recognize how we're feeling because a big problem could arise. There's a whole body of research showing that, and Nick is an expert in this, that people don't necessarily understand each other very well. So now we think, oh, machines will understand us. And so what could be a potentially quite problematic is if we now think that you know, machines we can build these machines will understand us, but actually they misunderstand us. So they are responding to their assumptions about our emotional state that are totally off.

Adrienne L: Yeah. And if um, I'm wondering if if machines great at understanding where we're coming from just by listening to us is part of that because what humans glean from voice conversations with one another is largely based on sort of not the, the vocal parts like the pauses, um, where you might stumble. Is that where most of the meaning resides? There's at least a significant portion of it.

Nicholas Epley: That's where the inferences about mine come from. We find, so it's in the Para linguistic cues that are contained in the voice in particular. Like I can't, I can't see your mind. I can't see you thinking. I sometimes see you feeling, but lots of you are feeling lots of different things right now and none of you are showing any of it to me. You're all giving me mostly a bank expression except for that guy who has given me a nice smile. Um, thanks and yeah and so I can't see you in mind but, but we do find that you can sort of hear it or at least you think you can hear it. And it comes through the Para linguistic cues that I actually think are fairly honest signals of conscious experience as they're happening. We haven't

been able to study accuracy quite yet, but intonation is one and an intonation has variants in tone. So it's the standard deviation of the pitch on your voice. That's the statistical calculation of it. So your voice rises and falls in pitch. You also speed up and slow down. And so you can tell that somebody is thinking when they pause for a minute to think and then they picked back up again. You can tell when somebody is pretty excited cause they're speak more quickly and then slow down. And so it's the Para linguistic cues show up and none of that is visible in text per se. It's all stripped out of that.

Rana el K: And also Alexa isn't listening to any of the, I mean Alexis just taking your audio and, and kind of Lex, you know, converting it to the Lex, the actual words you're saying, Alexa at the moment does not consider the pair linguistic features. It could. And I think that's where the industry's going. So eventually you will listen, you know, we'll kind of grab onto these. So what could a smart speaker do that's different than today? If it could read these parallel Guisti cues more precisely or at all, it could say, Adian you sound really upset today or you sound really stressed today. Do you want to take five minutes to meditate? Right. Um, I'm doing client thing. [inaudible]

Rana el K: better to, yeah. Well, but that's exactly a big part of, of of this whole, even with vehicles, right? Like how the machine reacts back is going to be critical to building trust and not being frustrating and annoying. Yeah. Well, and I think the point that you make about trust is so important and I think part of trust is feeling understood, right? Feeling like the machine understands me. And so I do feel like there's a risk of like leading consumers to think that the machines can now understand us when it's a hard problem. So there's this very classic study in social psychology where you put a few undergrads in the room together and then you the experiment or leaves and then the room slowly begins to fill with smoke. So what do people do? They look around at each other and what does everyone look like in this confusing potential? It

Elizabeth Dunn: looks like this blank. Nobody knows what's going on, right? And then they look to each other and they all interpret this blank. Q is meaning, there's no problem here, right? So I think a, and, and you can watch the room just gets real, real, real smoky before anyone leaves because of this problem. Whereas if you just have one person room starts to fill a smoke, they get out of there. And so there's these, these potential problems of misperceiving each other's emotions I think are really important. And partly because you know, if we do have someone stand up and do your best smirk or do your best smile, that's easy to read. That's an easy problem to solve. The hard problem is what are all of you thinking right now? That's what I want to know. What are all of you thinking? And it's really hard to tell from your current facial expressions what you guys are thinking and we'll find out in a minute cause we will go to questions.

Adrienne L: But before we do that, um, I wanted to ask, I mean, so all of this, this research and these new technologies are developing also at a time when the way that we relate to one another is, seems to be profoundly changing because of

technology. And I know, Liz, you've looked a lot at smart phones and sort of how the extent, I mean I put it this way, I think you've brought a lot of nuance to a lot of the anxiety over smartphones while also showing that there are things that we should be maybe concerned about in terms of how we relate to our phones and how that affects how we relate to one another. Um, maybe you can talk a bit about the experiments you've done. Um, the uh, mapping experiment I thought was particularly interesting. Sure. Yeah. So I mean there is so much speculation out there about how our phones are affecting us.

Elizabeth Dunn: Probably a lot of you have theories about this. Um, and so, um, what we try and do in my lab is actually alter people's behavior and then just see what happens. So, uh, in one of our cities, for example, we wanted to pick a task that phones are really great at. So we ask people to go out on our campus and find a building that we knew they were unfamiliar with. And we either had them lock up all of their belongings in a cabinet, including their phones or we had them lock up all their belongings. But we said, you can hang onto your phones, you know, so feel free to use your phones now. Uh, it won't surprise you to learn. People got to the building four minutes faster when they had their phones than when they did not have their phones, almost everybody did make it to the building.

Elizabeth Dunn: So people who say millennials can no longer get anywhere without their phones are wrong. Like you can, they did eventually get there, took them a little bit longer. Um, Eh, but interestingly, uh, they felt less socially connected by the time they arrived at the building if they had had access to their phone during this task. And what we noticed is that when people had to solve this problem, had to find this building without their, their phones, the typical student talked to three other people on our campus on their way to find the building. I will let you guys yell out. How many people do you think the typical person talked to when they had their phones? Zero. Exactly. It's like, so basically cuts out little interactions, which again might seem a trivial, but it turns out that these small interactions that we have in everyday life can actually make a difference for our feelings of connection.

Elizabeth Dunn: Now you know that there have been headlines about some of our work that are like smartphones are ruining our lives. So I just want to be clear, like overall we actually saw people in the phone group, people who had access to their phones, we're a little bit happier by the end than people who did not have their phones. And the reason why is phones make things easy. People love easy stuff like easy is good. He's, he makes me happy. But this massive benefit that this convenience and ease provided was largely undercut by this loss of social connection. So one thing that tells us is that phones aren't just doing one thing. They're changing our lives in multiple ways at the same time. That may partially cancel each other out. And it may depend on the particular features of the situation, whether the phone is really gonna hurt you or help you.

Adrienne L: And I know you said, um, that millennials still figured out how to get there. Um, but looking even farther to the future, do you see as we outsource more of our

human to human work are the way that we communicate or, or connect with one another as we outsource more of that to machines? Do you, do you think that we'll end up forgetting how to have conversations or forgetting how to read facial cues? I mean, I know this may be on a answerable at this point, but I wonder what you see as sort of in the same way that I'm sure a lot of us are, at least I'll speak for myself. I don't have the same number of phone numbers committed to memory as I once did. Um, what will we lose as machines do more of the work for us?

Nicholas Epley: So one thing that I'm worried about is that we'll lose things that we're not aware we're losing. So a lot of, and I predict pretty much anytime new tech comes on the scene, there's, there's a period of years where we fumble around with it until we figured out how to use it. So when, when cars were first built, they were deadly because we didn't design them with all sorts of safety features. Now they're pretty safe, uh, much more quiet, safer than they used to be. Um, one concern I have about some of this tech and in particular about the social consequences of the tech, of the kind that Liz just mentioned here, is that it's not always obvious to us that we're losing those social effects. And hence the technology can't necessarily, is not necessarily going to be designed to fix or to bring back some of those social costs.

Nicholas Epley: It's obvious what efficiency gains we're getting. But if you and I text to each other and I infer incorrectly that you're an idiot because I don't really, I don't, I don't connect with your mind in the same way as if we were talking. I would never find out that I was wrong. I just conclude you're an idiot and we'd go on our merry way and I'd never talk to you. I wouldn't find out that I wouldn't find out that I had just screwed up. Essentially, if I lose these little moments of connection throughout my day, that make me feel just a little less connected to human beings cause I never talked to them any more than I would have otherwise I might be left feeling just a little isolated and disconnected from others. I wouldn't necessarily know why. It's not clear to me that we have the ability right now to pick up these social forces that we're

Adrienne L: losing from tech in a way that would make them better. Well, and arguably it seemed, and I want to go to wrong, but it seems like we might already be seeing some evidence of that with the polarization of society. And um, did you have, go ahead. Yeah, I mean if, if you, if you don't lose a muscle, it atrophies. Right. And so if, if I, I worry, I have a 16 year old and a 10 year old son and my son, you know, communicates. Yeah, I worry about him not really learning about social cues in, in, in the way that I did for example. But I think the solution is not to do away with technology but to redesign technology in a way that accommodates how do how people communicate naturally through conversation, through emotions, through, you know, perception through empathy. We need to redesign technology in a way that you know, understands people.

Adrienne L: And you do see, I dunno any number of you who have spent time with teenagers who have smart phones, there is this sort of new yes, they may be,

I'm spending time just looking at their phone by them. It's not themselves, but you also see groups of teenagers get together all with their phones out, all looking at it and talking about it. So there is this new sort of social, uh, dynamic that's emerging from this that I think at least I certainly haven't figured out, um, what it means or where it's taking us. Um, I'd like to take some questions before we bring our next panelists up and have these panelists take some questions. If anyone has a question, just sort of wave your hand. I see someone way back here. We'll have a Mike, um, come to you all the way at the back. Put your hand up again. Yeah, there you go. Great.

Audience Member: Um, hello. Good afternoon. I really enjoyed this panel and the back and forth and the complimentary, um, kind of approach that you have by was like I had in the back of my mind the kind of comparison to what you're saying here. You're designing AI that works in this word. Uh, but if I have in the back of my mind, I have my region coming from the Middle East, Africa, it's not applicable in there. I mean, if we score people on Twitter for like, um, the bad mood that we can make, it's not as, it's the news. So we're just reporting. I mean, I'm reading the face is, is very complicated for us. It could be used against as an oppressive regimes. So you as experts leading, and I guess you're from the region. So how can we just have this technology but in our favor instead of having it used against us, it's very important to keep this in mind because you're shaping the future somehow and that's, that has a lot of implications in there. Thank you.

Rana el K: Yeah, that's a great question. Yes. And I spent a lot of, I still spend a lot of time in the Middle East, both in Egypt and UAE, um, which, which as a country, UAE is very, is on the forefront of deploying these AI technologies. And I have a lot of question

Rana el K: marks around some of the use cases, but again, technology is neutral, right? It's how we decide to use it. And who do we decide to put in control of this technology? That's a real important question. I mean, we, our two biggest competitors are two Chinese companies that do not share our core values around data privacy or consent or use of data or misuse of data. And that's, that's concerning. So how do we deal with that though, once the technology is developed? I mean, I'm thinking about, um, if you look at a synthetic video or the videos that are made that can make it appear as though someone has said something and they're quite convincing at this point and getting more advanced all the time. Um, synthetic video in many cases was developed to make conference calls smoother so that if you lost connection in the person's face when go away, totally innocuous application.

Adrienne L: Now we're worried about, you know, people making deep fake pornography that portrays people without their consent, that's not actually them or heads of state being portrayed to say things they haven't said that could potentially start a war. I mean, so once you've developed the technology, how do you prevent a, of an oppressive regime or anyone else with bad intentions from using it? So I think kind of the innovators, like society has a big role to play in that. Like

consumers have to take a stance against these types of companies or redeems or governments. Um, and that's gonna put a lot of pressure on companies to a bar, you know, abide by these regulations. Um, we're part of a consortium called the partnership on AI. It was started by the tech giants, but they've involved both startup, you know, startups as well as other stakeholders like Amnesty International and ACLU. And I think that's the right direction to, you know, people who are designing these technologies need to step it up and, and really kind of think about the applications. We could totally keep going on that, but I want to have other people have a chance to ask questions. I'm, someone's going to run to with a mic. Thank you.

Audience Member: This is so interesting. So I'm curious, is there anything in the pipeline with my smartphone that is like a voice text because I'm, you know, we all text and like I text my daughter but there's not the inflection in the voice. You're like, honey, call me honey. Call me.

Rana el K: Right. Or um,

Rana el K: you know, just into, is there anything that would be like a voice text instead of just all this typing in Emoji fonts?

Rana el K: I have an iPhone and it can do that now.

Adrienne L: It has a phone, it has a phone on it. You can actually remember when we used to use them this right. Hi, how are you doing? Voicemail, you know, and not guilty of this. I don't. I think the challenge though is getting people to use those, the recipients. I don't know. I think part of it's because you, you can't

Nicholas Epley: tell what you're missing. Yeah. But it's also important to note that technologies is neutral, right? And we use them for lots of different things. Lots of what we use. Text fours, community, make kidding, communicating small bits of information. And that's fine with a short text. So, right. If, if Liz wants to tell me where we're going to dinner tonight, just send me a quick note. Here's the address. Great. Send that to me. The text, don't call me. I don't need your voice for that. But if Liz wants to tell me how things are going in our research these days and how she's feeling about it, she better not send me a 20 word. No texts. You better give me a call about it. So, I mean, I think from my perspective, the interesting thing about tech is, is our capacity to use it wisely or unwisely. And it's not obvious to me that we always know when we're using it unwisely, we think we're to do it a lot. I don't have a great solution for how to do that, except we keep doing more research, find out what the facts are, help people become wiser, a little faster than they would otherwise

Speaker 2: go.

Rana el K: We have time for one more from this group that he's hiding behind. Sorry. Oh, sorry. Hi.

Audience Member: Oh, I have a question. Maybe building on the previous one about universality a. So Ronnie, the Ekman research suggests that these cues are universal across culture. I'm curious if that's still the current view. And then on the apparel linguistic cues too. Is that as universal? I mean, I grew up in Canada. The joke is every word, every sentence is a question there, right? So how, how universal are these cues and different modalities?

Rana el K: I'll tackle the facial expression one. Um, I'm a huge advocate of f Ackman's work mapping, kind of the facial action coding system, which is mapping the facial muscles to these action units. Essentially building on objective scoring mechanism for faces. I am quite, I'm not quite sure about the mapping of these acts of his work around mapping expressions to like six universal basic emotions. Um, and I spent in academia, I spent a lot of years like basically showing that there's a lot of other expressions and emotions that may or may not be universal in our data. So we've analyzed these 8 million faces, um, from 87 countries around the world. We found that by and large the expressions are universal, but there are cultural norms that depict when, um, people either amplify an expression or dampen it or mask it all together. And that's where the intercultural, you know, the cross cultural differences come. And it's true that Americans are smiler. We found that, um, women, women in the u s tend to smile more than men and, um, 40% more than men in our data. And we did not find any Brits in the room. A few, no. Nope. Okay. One Brit in the reading, we found no statistical difference between men and women in our data in terms of how expressive they are. So That's interesting. All right. Um, we do have time for one more if you'd like and there's someone coming to you with a mic.

Audience Member: All of us can disguise [inaudible] any water

Audience Member: bus can disguise our look or our feelings, our expressions. To what extent can you detect that? And can you detected in a world class actor who, who plays the role of somebody else

Rana el K: camps. Right now we could do like micro expression like, like, but we do not do that. So, so our technology cannot,

Nicholas Epley: I'm not optimistic about micro-expressions either. They don't reveal honest emotion very clearly except in really extreme cases when there's a huge literature on lie detection. Um, people think faces convey whether you're lying or telling the truth or is that they don't well at all. The best way to find out whether somebody is lying or not is to ask them, are you lying to me right now? Turns out to be the most effective way. I've seen at least the biggest effect size. Um, but no, and I think that's one real challenge for, for accuracy from bodily expressions and facial expressions in particular is because we, we can fake it really easily. Really well. And it's very hard to detect as an observer. It's possible AI could, could get there. I don't, I would, I'm skeptical about it. I, I would have to see the data on that. Mostly because our, our bodily expressions evolve to

lead as well as mislead other people with what we're feeling. We use them for both. Right.

Elizabeth Dunn: On that note, what do you, so what do you use as your kind of ground truth? If you're seeing somebody smile, do you know that they're actually feeling happy or could it just be there be called like we just, we just labeled for smile. Okay. So you can't say you can't go from their smiling to, they're actually happy. You just know that they're smiling. Correct. That's why I was thinking about that too with the, if American women are smiling more, how much of his is that his happiness versus norms that made say women should, you know, women hear that all the time. They should smile

Nicholas Epley: social, great work by Ann Crane, who's a psychologist at Berkeley who looked at stereotypes about men and women. Men are presumed to be, uh, less emotional than women. That's the stereotype. And so what she did was she put men and women in front of emotionally evocative films, recorded them physiologically you can detect emotion on emotion from a few, uh, physiological signals, heart rate variability, and skin conductance were the two that she looked at that I remember, uh, as well as just asked them self-report how happy and sad the movie made them feel. Then had observers watch your videos of the men and women watching the videos. So sort of many of Meta Meta movie. So I'm watching you watch the video. And what they found was no difference in the emotional experience between men and women, but a significant difference in emotional expressions. So men and women reported feeling the same. Their physiological responses look the same on average, but women tended to smile more, show their emotional little more than men did. That led observers who were watching you to believe that women actually work spirit sensing more emotion than men were when in fact it was just about your expression.

Rana el K: You could do a whole panel on that. That's fascinating. Well thank you. I'm don't sit or stand up in a moment, but I think you're plugged

Adrienne L: into your mix. But in the meantime I will bring up with the next panelists. We have Neil Liebowitz, a psychiatrist and the chief that, yeah, thank you. Please. Yeah, so thank you all very [inaudible].

Speaker 2: [inaudible]

Adrienne L: thank you. Um, we have Neil Leibowitz, a psychiatrist and the chief medical officer of Talkspace and joining him is Nancy Lublin, the cofounder and CEO of crisis. Textline hello. Make their way up. Thank you both for being here. So we have talked about faces and voices and a little bit about text and we're going to move a little bit more into the world of text-based communications. Now. Um, you both largely focused on text and how it can remove barriers to communication. And I wonder, um, Lancey maybe you can start by talking about why it's important to give people the ability to text, uh, when you know, they might not be speaking or seeing each other.

Nancy Lublin: We are about to be the defenders of text. I feel a little bit like the teenagers who come up after people like said Elvis gyrates rates too much. I'm a writer, so I'm here for text, right? Like text, text. There's so many good things about text. I'm going to make you all very happy that you're paying your kid's cell phone bills because it turns out Texas. Fantastic for some specific things like for what we both do, Texas is a fantastic way to say things that you're not comfortable saying to someone's face or by voice texts. 66% of people who text us at crisis text line share something they've never shared with another human being. So they're,

Adrienne L: how about this? A little, cause this is surprising to me that people would be willing to commit to text to commit to writing their deepest secrets or their most difficult struggles,

Nancy Lublin: especially to someone they don't know. So crisis text line is strangers counting strangers and they're in their most dire moments. So it's not therapy. Crisis text line is in that heat of the moment. And um, and so it's people coming out for the first time. It's people saying that they have suicidal thoughts for the first time. Um, and there's a veil of ignorance. So there's no assumption about age or race. There's no judgment. You don't hear someone gasp, oh my gosh, how could that be happening to you? You don't hear any judgment and a voice. Um, it's really straight up fact. You don't get crying, you don't get repetition, you don't get the word. Um, um, it's a fact and feeling an emotion from the texters and from our crisis counselors. It's validation, unconditional love, strength.

Adrienne L: And you're around Neil. It's similar but not necessarily in such a dire moment for people. So

Neil Leibowitz: the original text, our letters, yep. And people communicated for centuries with letters and I even remember reading my grandfather's memoirs and he was never able to communicate the way he did there. He was never able to tell the stories. And we finished recently a study on post traumatic stress and what we found was the dropout rate was much lower. And the real reason is because people coming in and having that veil where they can communicate on their terms makes them comfortable. I used to wait eight weeks, 10 weeks when I was practicing more for someone to share things that people are saying to us within a week. Third Message, third message, they've spilled their guts to us

Adrienne L: is that, and that's the like you've looked at all of the data and that's the average

Nancy Lublin: 110 million messages we've processed. We were about six years old. By the third message, on average, people have told us exactly what's going on. I just lost my job and I don't know how I'm going to hit my pay, my mortgage. I'm a, I'm being bullied at school and I can't go back there tomorrow. I mean by the third message that they've spilled to us, what's going on.

Adrienne L: And it's just remarkable that you can even find that kind of pattern. So, and I know this is something you're both thinking a lot about, this data-driven approach to mental health. What is it, when you have an aggregate, um, you know, you have all of this data in aggregate. What can you learn about how people are doing, not just at the individual level, but as a society or in certain demographics that we couldn't previously? So we have, I mean, it's a baseline, right? And so, um, so we have been able to learn, yeah,

Nancy Lublin: things that make us faster and more accurate, so faster. We stack rank the queue based on severity. We don't want your kids to die anymore from suicide. Okay. Suicide is 100%

Neil Leibowitz: preventable, 100% preventable.

Nancy Lublin: And so my goal is to get to those kids who are at imminent risk as quickly and as accurately as possible. And so a, when we first launched, we put a few words into the algorithm that we knew would be high risk, like suicide, die overdose gun, and saw that we could take our high risk people in about two minutes, high risk or people who have the ideation, the plan, the means and the timing to commit harm to themselves or frankly to someone else. We see about one to two homicidal texters a day. That's their mostly school shooters. Sometimes it's small bombings and sometimes it's partner homicide. But, um, and with those instances, we call nine one one. So we have a baseline. When we hit about 20 million messages in our corpus, we looked and we said, when do we really call nine one one, what are the end Graham's bigrams and trigrams, what are the words and word combinations when we actually have to call nine one one but we can't get you to a happier place where we can get you to put the pills in a drawer or put the gun away.

Nancy Lublin: Um, and it turns out there are thousands of words and word combinations that are more lethal than the word suicide. So the word military twice as likely that we will have to call nine one one than the word suicide. If you texted and say I'm in the military twice as likely, we're going to have to call nine one one than if you texted and say, I want to commit suicide. So how unhappy face crying Emoji is four times as likely that we're going to call nine one one and the most lethal words in America or any named pill. So how do you handle that? I know you say you call nine one one. When you think someone, when you believe someone might harm themselves, but how do you take 120 million messages, however many, how do you convert that into action that actually can save people's lives?

Nancy Lublin: So we stack rank the queue in real time. So we use AI like these guys use AI. And so, um, we function like a hospital emergency room. If you show up at the hospital emergency room with a heart attack, they're going wheel you right in and make the kid with the sprained ankle wait for half an hour. That's okay. My son and a soccer sprained ankle, he can wait for half an hour while they take the heart attack or the gunshot wound. A hotline should work the same way. We should take the higher risk people immediately. Um, and so now thanks to

machine learning and AI and all that natural language processing, we take those high risk cases in 22 seconds. So I don't want to get too into the technical weeds, but I do want to get a little into the technical weeds. Is this, um, the natural language processing you're doing, is it semantic analysis that's trying to judge words based on how positive or negative they are?

Nancy Lublin: Sort of described the methodology a little bit more in depth. So it's similar to what we heard before. There's a baseline. We can see what are the words, were we in conversations where we have had to call nine one one and it updates in real time. And so the algorithm gets smarter the more volume, velocity and variety that we have. What are, I know you mentioned military names of specific, uh, drugs. What are some of the other words that have emerged that surprised you? Let me say a good ones. Yes, that way. Miserable. So let me say good things. There are words that also can tip people to a positive place. I'm so smart, proud, brave, impressive. These are really good words to use with people. Um, who are in a hot moment. Um, we should just all be saying that to our kids all the time.

Nancy Lublin: That was a really smart decision you made. That's a really impressive choice. Wow. That was really impressive that you could share that with me. Um, anxiety is on the rise with young people in America. The end to this is to anxiety. We see as the word strong. What makes you feel strong? Tell me what makes you feel strong for most of them. By the way, it's music. Um, so, um, we talk a lot about music. Um, the other thing we hear a lot about with anxiety is sleep. 21% of our conversations explicitly mentioned sleep. Young people in America are just not sleeping. Um, and that's a problem. So how does this all apply to, into the therapy realm? I mean, it sounds like in both of your cases, you're potentially reaching entire populations of people who might not have ever accessed care before. Um, how does that play out in your, in your field? Who here knows what the mode

Neil Leibowitz: number of therapy sessions that occur? What were the number of average number of sessions? I'll take either answer for someone going into therapy. One, one, most people go to therapy once and never show up again. And the average number of completed sessions is less than two. So we're not getting to people. And the question is how do we get to people and how do we get to them quickly? So one of our goals is can we give therapists the tools to make them better? Therapists, we believe strongly in the concept of the practitioner of the therapist, but we want to help them. We want to tell them once they're going to lose someone before they know they're gonna lose someone, what their risk of the discontinuation is. And we've looked at that and what can you do when someone's at risk of discontinuation? We have the ability to send audio and video messages as well.

Neil Leibowitz: Maybe for this person at this time a video message will save them. Maybe talking about something else. We'll save that. Maybe some diagnostic intelligence looking at the millions of messages will tell us that yes, we thought

they had an anxiety disorder, they're diagnosed with it, but there's something there that's a post traumatic stress. It's triggering that algorithm to say consider it. We would never do it, but we want to give them those tools to see something perhaps a couple of weeks, days, months before they do. And if they can keep people in treatment, we're already making a difference. The number needed to treat the number of weeks generally looked at to get so on well is between eight and 12 sessions. So we're looking at two and three months. And when you hear that most people are in treatment, one to two weeks, we're really failing. So what can we do to do that? And whatever it is, if it's face to face, I'm for it. If it's digital, I'm for it. But it's really about getting to people.

Nancy Lublin: I think this is a fantastic solution. I just to be clear, this is not like a paid endorsement we've never met, but I know this is a fantastic solution because for the most part, if you want to be in therapy, you have to be available. You've got to be sort of near a therapist like in a city for the most part and available during business hours. And that's hard for a lot of people and this puts it in your pocket. I just, I think it's super smart. Um, it's not what we do, but yea, I think that's super smart too. So

Adrienne L: in both cases there, there's, as with the other conversation we had, there are substantial privacy questions that emerge. You have these reams of data, including messages of people confessing their deepest secrets and worries, things that conceivably could be used against them by employers or in custody battles. Um, how do you think about, well, first of all, how do you protect that data?

Nancy Lublin: So, um, we, before we even launched, we spent a lot, but there's so many lawyers on my board and like I did that on purpose where we launched and we built to the European standards before GDPR was a thing. I mean, we just said, what are the toughest privacy standards in the world? Let's to that. So we built to those standards from the get go so that, that's one. But, um, look, we're a not for profit. Um, I'm not here to make money, um, much to my parents to grin. So, um, that was funny by the way. Okay. Thank you. I'm Jewish. My parents are very upset with me. Okay. I didn't become a doctor, I didn't become the lawyer and I married a man and the last name Diaz, I'm really, I'm not doing [inaudible]. You're smart. You're good. Okay. Good day, my friend and we're good.

Nancy Lublin: Okay. So anyway, um, but I'm like, uh, anyway, um, okay, so, um, therapy is happening right now. Exactly. But I'm not even texting him. So, um, I w privacy, I'm, I'm here just to help people. I mean, I'm, I'm not, we're not here to make any money. I'm really just here to help people. So there's, there's two things that crisis text line is all about how do we get to people and they skew young, poor, rural and diverse. So these are people who don't have access to help other ways. How do we get to those people as quickly and as with the highest quality possible. And um, and it's all free and we don't even pay texting fees and the textures don't pay fees and we don't even show up in texters bills. So there's

total anonymity. Um, and then the second thing is how do we learn, how do we, how do we get this data together?

Nancy Lublin: I would love you if some of the researchers who were up before this, like we've opened up enclave access, there've been five papers published so far. There are 10 more coming in the next 12 months. Um, we wanna fuel really smart learnings based on this data corpus. We're just here for the public good. And so if we're here for the public, good privacy should be the most important thing. I'm, I um, I just wanna I just wanna make the world better now, how about you? Oh yeah, that is incredible. Um, how about you? Is there ever a case when it's appropriate to share data from what you, you, um, learn or from what people submit to yours?

Neil Leibowitz: So what's really interesting is we're moving into a new phase of data. It used to be someone would disclose my electronic medical record, my X-ray, now they can disclose the treatment. And we've had a couple of really interesting cases or odd cases where, for example, I had one actually the other day where we got a complaint from someone's spouse saying that the spout other side, the husband in this case was showing the wife the message and she was very upset by what the therapist was saying. Now what it was was a very clever screenshot that cut the post in half and when you read the first two sentences it says something when you read the rest it makes sense and it's very ethical and we had this person who set and it was really being used as a weapon of marriage destruction perhaps there I say and we're moving into this realm where now people have not only their medical record, now they have the record of treatment.

Neil Leibowitz: It's dangerous as a company we will fight never to turn that over. That is the treatment that is not the medical and we have been subpoenaed. We have never turned it over or we have no intention on turning it over and we'll take it as far as it'll go. As a lawyer, I did some case, I did look and there is no corpus of law that really addresses a lot of these modern day issues and the states are way behind, not their fault. It's as to be expected and we're going to need to figure out, as we have different types of information in data, what the regulatory environment will look like and how that will work. And honestly, it's not only ethical, but it's also in our interest. We don't want this disclosed. We want people to feel safe and treatment because once that treatment record comes out, it's done. That veteran with PTSD, they're not coming in if they feel it, that that is going to be exposed.

Nancy Lublin: The limit though is we believe that your life matters more than your privacy. And that's not the case for every hotline around the world. But we believe that if you're an imminent risk, we d encrypt and we call nine one one. And um, and cause we think your whole life could change tomorrow, especially all these young people. Um, so, uh, that's when your privacy goes out the door. You're threatening harm to someone else or to yourself and it's imminent and credible

and there's a, an a, an imminent timeframe. Um, Yep. We're gonna, we're gonna send help.

Adrienne L: We're going to take questions in just a moment. Um, last question for me, given all of the aggregate data you have, given how much time you've spent looking at how people communicate, what is your sense, and, and this is a big question, maybe too big, but what is your sense of how people are doing and how that's changing? I know we hear a lot about young people with more anxiety than ever. Should we be optimistic? If not, why not? I mean, how are people doing it? It doesn't look good.

Nancy Lublin: Yeah.

Neil Leibowitz: I thought you were an optimist. I'm the pessimist. So I definitely have concern. And it's funny, I actually, we do work with colleges and we have this cottage industry where we do work with fraternity. So they asked me to speak and one of my messages is you need to talk to people, not just to a therapist and you need to talk to your parents. You need to talk maybe about what did go over that. While I think with some, you need to talk to your pastor or your rabbi or your religious leaders, you need to turn to your friends. And yes, a professional is very helpful. Yes. A crisis counselor is very helpful in their situations, but I think people are coming to us more because they're lacking that and we need to move back to that. And I'd rather, if people talk to their parents, then sign up for us. There are enough people who need help that we can afford to lose plenty of people if they're going to their community for help. And that to me is really the major way we're going to make this better.

Nancy Lublin: It's, um, it's not good. Um, I didn't come to this from mental health. I come to this as a tech start up person. Um, and I also went to law school, but we don't like to talk about that. Um, and uh, yeah. Um, and uh, it's bad. So 15% of our texters right now, um, indicate that they're under the age of 13. They don't even all have phones. So to have such a huge chunk of middle schoolers texting us, but here's the kicker, 20% of them without us asking what them just self-disclosing 20% of those middle schoolers indicates that they're self-harming. They're cutting. Um, cutting is the new eating disorder. Um, I remember eating disorders, um, cutting is, it's just alarming and there are not lots of organizations, lots of research, lots of talk about it and we don't even see it. You could see the person with the eating disorder, you could see it in their physical appearance.

Nancy Lublin: You can see it in the way they reacted to food. You're not seeing your kids are covering their legs with jeans and with long sleeves and you don't, you're not seeing the self harm, self harm numbers are, um, are very disappointing and scary to me also because most of them say that it is a form of self care. They, they are not, they say it's how they process emotion and how they feel. So they don't think that it's a problem. Um, the anxiety numbers are incredibly alarming. Um, and going up a third of everyone who texts us references social media. So I

think there is definitely something going on there. Um, um, if you want, we have aggregated and anonymized all of our data. You can look at it. Um, at crisis trends.org, it updates about every 30 seconds. Um, one of the most interesting things, or the word clouds at the bottom. So you can see like anybody else here from Connecticut. I'm from Connecticut. We're the number one anxiety state. Um, and um, yeah, number one. Um, uh, again, I'm funny, I know it's a hard topic, um, but there's a whole bunch of, you can see all of this aggregated data. The one that really kills me, and I'm a mother of two teenagers, is every single word cloud. It's the top 35 words and there's one word that shows up in every issue and it's mom.

Nancy Lublin: On that happy note, should we take some questions? We're running out of time, but I want to make sure to get to you guys. Um, it seems like someone over here in stripes, the mic will make its way to you. Um, I'd like to hear more about your statement. Uh, when you mentioned that suicides are 100% preventable, this is, it's self-inflicted. It's the result of a terrible disease of depression or of an in the moment decision. Um, but it's, um, it's present, it's preventable. Here's the most interesting thing that we found in our, in our research and our data, um, is how that it's never harmful or suggestive to ask. Um, you've might've seen the memes on Facebook. Like I've always got a kettle on. If you've seen that one, the kettle's on and you can always come and talk to me. Um, I'm here for you.

Nancy Lublin: Those are all I statements. The thing that we found in our data is asking a you statement, um, and the way to ask it. So the timing and the way to ask it, to ask it early in the conversation, um, and to ask it with an expression of care, I'm concerned about you. Um, I need to ask, are you thinking about killing yourself? And it's the words killing yourself or are you thinking about death and dying? Don't say the word suicide necessarily. And that that's the most effective way to ask. And by asking, it's not harmful or suggestive. You're letting someone be seen. You're showing them that you recognize the depth of their feelings. Um, that's not to say that, um, it's on each of us to save the person next to us. That's not what I mean when I say it's 100%, 100% preventable. Um, what I mean is that it's not, it's a, it's an incident that could have been avoided. Um, but that doesn't mean that it's on each of us to save the person next to us. It's on ourselves to reach out for care, um, um, to make more resources available. It's too hard to get mental health care in America. It's too expensive still. Um, um, and we need more cures for some things that really should have been cured a long time ago. Other questions right up front.

Audience Member: Ronna. Put here. Just wait for the mic. One Sec. Why do you think some people actually text you on some other stuff? Well, what makes somebody, I mean, somebody has these suicidal thoughts or, you know, homicidal thoughts.

Nancy Lublin: We see everything. I mean, we see all the things. Um, and like I said, they skew young, poor, rural and diverse. So Young, 75% of our texters are under the age of 25. That's how they communicate. They text, um, um, uh, poor. They don't have access to other things necessarily. If you take the nation by the, the 10%

poorest, um, area codes in America, that 10% uses 19% of our volume. Um, rural, you can again map that by area code and diverse. 19% of our texters identify as Hispanic, 12% black and five and a half percent native American, which is pretty amazing cause only one and a half percent of America is native American. Um, look, I would like every solution to be available when you can have a Tupac Shakur, Hologram Council. You, let's do that. I mean it should be easier to get help than avoid getting help phone drop in centers. It's a, it's a crisis. Suicide is up 33% in America since 1999 every single person in this room knows someone who died by suicide. All of us know someone and um, it's still too hard to get help.

Adrienne L: Want to get help, please get help. So they're texting. Yes. And which is interesting. Maybe not everybody wants to get help. Well, and maybe the implication there, that's sort of a question you're implying is how do you reach the people who aren't reaching out themselves and you have to make it as easy as possible. So the data is, most people have reached out on almost everyone who has a completed suicide has reached out to some health care provider in the last month or two. That's what the data says. Whether it was recognizable

Neil Leibowitz: or not, I don't know. People are reaching out. We're not always equipped or no, sometimes we miss it. It's not a Monette. It's out of beneficence. But we're missing it.

Adrienne L: We have time for one more question or are both of you ask them and we'll combine them? Um, I dunno who was easier for the mic to get to, but, well we can try to get to both.

Speaker 12: You said that you would call nine one one hour.

Audience Member: How much information do you have when you get to that point? Yeah. Does you have a phone and a person on the continent? Okay. And what was your question? I'll see when you buy my questions on data sharing. Um, accuracy, accuracy can be brought to the patient's health care. If the data's shared and there's historic data between healthcare institutions, how does that work with the technology that you provide? Um, between a third one third was for example, and just quickly, um, once a data is encrypted and it's given to emergency organizations, does that data then belong to them? It can be used in court in

Nancy Lublin: Cummins semester. So we don't share data unless there's, um, a legal request for it. Um, including we have had, uh, police officers who had just happened to be the parents of someone texting and try and get a transcript. And we were like, no, you've got to go get actual documentation. Um, for nine, one, one, what do we share with them and how does this work? First of all, and I say this everywhere because I think nine one one operators or some of the greatest people ever, they're are amazing, amazing people. And so I always want to point out that there are actually 6,000, 509 one one offices in America. And maybe

you heard me do this yesterday, if you were there yesterday, but for the rest of you, do you know how nine one one is funded? Local landline taxes? Nine one one is in big, big trouble and it is America's first first responder.

Nancy Lublin: That is the frontline of homeland security. Nine one one is critical. Um, and so we all get landlines. I still have a landline at home for that reason. I just want to contribute to them anyway. They're incredible people. What do we share with them? Um, uh, most of the time we don't get location data. We asked texters, where are you? We wanna send help. And sometimes they don't know, sometimes they're already incapacitated. Um, and so we do d encrypt and then some of what you see on the TV show homeland is real and they can geo locate, um, through cell towers and, and locate people. It's hard to do in cities because the z access is not great yet. Um, and um, so the accuracy is not always perfect. Usually people are home and usually home matches their cell phone bill. So those kinds of things are really helpful. Um, uh, but again, this is the kind of stuff that also needs improvement and there are some companies working on it. And to the other question,

Neil Leibowitz: Geo locate as well. So in a word is that's its own path. It needs its own panel. We are not where we want to be with data sharing with large health systems. We do what we can, we build within our program and share. But the healthcare community is not really anywhere near where it needs to be with data sharing.

Nancy Lublin: We're out of time. Thank you both so much for being here. Thank you to our earlier panelists and thank you to all of you. Great.