

Host: Robert Frederick

An experienced gun user can pull a gun from its holster, aim, and fire a gun at you in less than half a second.

**Interviewee: Jessica Witt**

When you have to decide quickly if a person, another person, is holding a gun or not... so if you're also holding a gun, then you're more biased to see other people as holding a gun.

Host: Robert Frederick

On this episode of The Conjectural—a story about how your ability to act can change what you see. I'm Robert Frederick.

Suppose you've got a gun. You're at a firing range. It's designed to look like a ghetto at night. There are paper cutouts of monsters and of regular people. With lights flashing and noises all around you, including the other people at the firing range who are shooting, you have to decide which of the cutouts represents a threat and so which of them to shoot. It's a scene from a movie called "Men In Black," starring Will Smith. While everyone else is firing, Smith's character, named Edwards, looks quickly around but does not shoot. At the end, after everyone else stops firing, Edwards fires just one shot. The door opens and the supervisor asks Edwards....

Clip from "Men In Black"

Zed:

Edwards, what the hell happened?

Edwards:

Hesitated.

Host: Robert Frederick

The supervisor then clicks a button and a cutout of a little girl with books in her arms comes center frame. There's a single bullet hole through the picture of the little girl's head.

Clip from "Men In Black" (cont'd)

Zed:

May I ask why you felt little Tiffany deserved to die?

Edwards:

Well, she's the only one that actually seemed dangerous at the time, sir.

Zed:

How'd you come to that conclusion?

Edwards:

Well, first I was going to pop this guy hanging from the street light, and then I realized, you know, he's just working out. And how would I feel if someone come running in the gym and bust me in my ass while I'm on the treadmill. Then I saw this snarling beast guy, and then I noticed he had a tissue in his hand and I realized, you know, he's not snarling. He's sneezing. You know? Ain't no real threat there. Then I saw little Tiffany—I'm thinking, you know, 8-year-old white girl, middle of the ghetto, bunch of monsters, this time of night with quantum physics books? She's about to start

some s—, Zed. She's about 8-years old. Those books are way too advanced for her. If you ask me, I'd say she's up to something.



Host: Robert Frederick

In the movie, Edwards has a lot of time to think before firing his gun — the whole firing range scene where everyone is shooting takes about 20 seconds. And, he had the luxury of all that time because nothing was shooting back, or even could shoot back.

So what happens when you only have less than half a second to think before you decide to shoot? A half a second is about the amount of time it takes an experienced gun user the time to pull a gun from it's holster, aim, and fire a gun at you. Here's how fast that happens, from seeing the gun....

SX: Holster pulling & shot

Host: Robert Frederick

We'll try it again. Ready? Gun.

SX: Holster pulling & shot

Host: Robert Frederick

Nope, not much time there to think through whether the person you're confronting is holding a tissue, holding books about quantum physics, or holding a gun.

Interviewee: Jessica Witt

So we have a line of research showing that when you have to decide quickly if a person, another person is holding a gun or not...,

Host: Robert Frederick

Jessica Witt is a psychologist at Colorado State University.

Interviewee: Jessica Witt

which is, of course, a decision that you don't have time to really ponder and think about, that your own action-abilities can create biases. So if you're also holding a gun, then you're more biased to see other people as holding a gun.

Host: Robert Frederick

Witt was speaking at a press conference hosted by AAAS. And I had to ask a question.

Interviewer: Robert Frederick

This question is for Dr. Witt.

Host: Robert Frederick

Of course, I was thinking about the quick decisions police officers make to protect their own safety as well as the mistakes they make because of biases.

Interviewer: Robert Frederick

You mentioned police officers, potentially, as people who had guns, would see others having a gun — they would be more inclined to think others did. Is there a way to un-train somebody or to train

somebody past that perception that they might automatically have to see someone else as having a gun?



Interviewee: Jessica Witt

Yeah, that's a good question. So, just to be clear, we actually haven't done these studies in police officers yet. Of course, perhaps the findings we get just with holding a gun might generalize to police officers. But we haven't tested that. What we are finding is that the biases are a lot stronger when people respond quickly. Not too surprising. But it didn't have to be that way. So people are making errors when they respond quickly and when they're responding slower. But it's those errors when they're responding quickly that are much more biased.

Host: Robert Frederick

What does that bias do, exactly? It makes people see guns when there aren't any. And because our police keep public records, we know that police have killed people because police thought a person was holding a gun but really wasn't. Each of these objects represents at least one person who died because police thought the person was holding a gun: a wallet, a shoe, a cordless drill, a hairbrush, a drink bottle, a bottle of cologne, a hose nozzle, and a cell phone.

Interviewee: Jessica Witt

And we're also finding that having some experience in a situation without a gun helps prevent some of those biases when you do have a gun.

Host: Robert Frederick

Which all suggests that police-training programs should include situations where police officers have to respond to a situation without having a gun in hand. As Witt and others have written, "If you're holding a hammer, everything starts to look like a nail." So, the thinking goes, if you're holding a gun, everything starts to look like a target. So perhaps the gun should remain in the holster a little longer?

Interviewee: Jessica Witt

So I know that in situations when someone might have a gun, you don't have the luxury necessarily of getting to spend a little bit more time looking. But what we're finding that if you can spend — and what we're talking about a few hundred milliseconds — if you can spend a little bit longer looking and gathering more visual evidence, then we see that these biases go away.

Host: Robert Frederick

And that's what having some experience in dangerous situations without a gun does — makes you pause a few hundred milliseconds more and really look. Now, a few hundred milliseconds, that's the time it takes to say "gun" a second time. It's also around the amount of time it takes to pull a gun out of its holster.

So, is that a gun?

SX: Holster drawing sound

Look. No gun.

SX: Placing gun back in holster. Sound of relief

Host: Robert Frederick

So having a gun in your hands gives you the ability to shoot, and that raises the likelihood that you see threatening objects. But this ability to act — changing what you see — Witt says it applies to a lot more than just guns.

**Interviewee: Jessica Witt**

If you're wearing a heavy backpack or you're fatigued, hills look steeper, distances look farther. If you're, if you weigh more than others — if you are obese — distances look farther and hills look steeper.

Host: Robert Frederick

In other words, both short-term changes — such as being tired or carrying something heavy — and long-term changes — such as being obese — change what you see. It goes for skills and using equipment, too.

Interviewee: Jessica Witt

So, for example, more skilled swimmers see targets underwater as closer than less-skilled swimmers. And then, there's a moment-to-moment effect as well. So if you are a less-skilled swimmer but you put on fins to make you faster, those underwater targets will look closer even though you're less skilled.

Host: Robert Frederick

It extends to baseball, too, and being on a hitting streak.

Interviewee: Jessica Witt

So if you're a really good baseball player, and you're hitting well, you'll see the ball as bigger. But if—on a given day—you're not hitting well, you won't see the ball as bigger you'll actually see the ball as smaller.

Host: Robert Frederick

And really, it doesn't matter whether you think you've have the skills. You actually have to have the skills. You can't just have a high opinion of your skills.

Interviewee: Jessica Witt

Golfers who played better saw the hole as bigger. But golfers who rated themselves as really good — it didn't matter — they didn't see the hole as any bigger. So it seems to be really, truly about action and not these conscious beliefs about what you can do or what you are.

Host: Robert Frederick

And that brings us to Witt's obesity study, and whether you think you're fat, but aren't, or whether you think you're thin, but aren't. So your physical body size versus your conception of your body size.

Interviewee: Jessica Witt

So the purpose of our study on obesity was actually to disassociate those two things, because a lot of people who weigh more than others tend to perceive themselves as being less heavy. And, if you know any teenage girls, you know a lot of people who are not very big perceive themselves to be bigger. And so we could dissociate physical abilities or physical body size with kind of your conception or your perception of your own body size. And what we find is that perception of

distance and perception of hill slant — that cares about physical body size, but it doesn't care at all about what you think about yourself. So if you think you're bigger — if you are less satisfied with your body — that doesn't change your perception at all.



Host: Robert Frederick

...of how far a distance is or how steep the hill is. So overall, Witt says, trusting what you see and really looking to make sure you see is what matters here, and that's a good thing. That's because trusting what you see prompts people who have less ability to do something from trying to do something that they really shouldn't do, such as taking the stairs two at a time just because that's what you've always done even though you're getting older or have become really obese, or are suffering from temporary back pain. In other words, Witt says, biases in perception are useful, generally.

Interviewee: Jessica Witt

So these biases in perception we think are actually really useful and really good, except when you need to change, and when you need to fight through pain, or if you want to change your lifestyle, for example, with obesity. And in that case, you can't trust your perceptions and you have to kind of go against what vision is telling you to do and fight through it. And the good thing is, that will change. So as the pain lessons, you won't have these perceptual biases fighting against you anymore, and suddenly distances won't seem so impossibly far, and hills won't seem so impossibly steep, and staircases won't seem so impossible. And so if you can get to the point where you're back to being, you know, physically active then vision will reward you.

Host: Robert Frederick

And all of this challenges the notion that we see the world as it truly exists, or that we even all see the world in the same way.

Interviewee: Jessica Witt

My research is showing that, instead, everyone has a unique perspective on the world — they see the world in a way that is unique to them — and that what dictates what they see is a function of their ability to act in the world.

Host: Robert Frederick

So, is that a gun?

SX: Holster drawing sound

Look. Gun?

SX: Cocking sound

Nope. No Gun.

SX: Replacing gun in holster sound + sound of relief

Host: Robert Frederick

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