

What is STEM Interest?

An Interview with Janet Yang

On March 14, 2018, [John Besley](#), the Ellis N. Brandt Professor of Public Relations at Michigan State University, interviewed [Janet \(Zheng\) Yang](#) to understand her thinking and work on the topic of STEM interest. Dr. Yang is an Associate Professor in the Department of Communication at the University of Buffalo in New York. Her research focuses on risk communication, especially the Risk Information Seeking and Processing (RISP) model. A video of Dr. Yang's interview, as well as interviews of other researchers, is available at InformalScience.org/interest.



Your area is risk communication, and much of your work is focused on the Risk Information Seeking and Processing (RISP) model. Could you tell us a little bit about how your work addresses the topic of interest in science communication and education?

In the RISP model, the idea of interest is actually very much intertwined with motivation. The key idea is to propose a set of social context variables or psychological variables that lead some people to be more interested in certain risks or scientific topics than others. The theoretical concept at the core of this model is from social psychology research and is called the sufficiency principle. The social psychologists [Eagly and Chaiken](#) proposed this sufficiency principle to account for the idea that all of us have an innate need of wanting to know things and wanting to know that what we believe is accurate or valid. What the sufficiency principle suggests is that people are going to exert a lot of cognitive effort paying attention to a topic until they reach a degree of judgmental confidence and can feel, “okay, what I know seems to be valid, and

what I know seems to line up with what other people know or what the experts say.” The sufficiency principle is at the core of this interest idea. Basically, people want to get information or think through information to the point that they feel it’s sufficient to accomplish their processing or other goals. Their goal might be to satisfy their own cognitive need for information; we know people have different levels of need for cognition. For instance, some people just want to know more about everything there is. Or they might have social reasons for wanting information; maybe you want to know something really, really well so you can take better care of your family or talk more intelligently about the topic within your social circle. So within the risk model, the information insufficiency idea applies to whatever really drives or delivers our interest in science and risk issues.

There are also additional psychologic factors. For instance, within the risk framework, risk perception is guaranteed to be a component. The model suggests that when people sense a greater risk about

a potential hazard, they're more likely to have a greater sufficiency threshold. In addition, there are informational subjective norms, which is where social assertions come into play. For example, maybe I'm not personally interested in knowing more about HPV vaccination, but I have a kid who is about to be in the age group that needs to get a vaccination, so that would be a good reason for me to pay attention to this topic. So all those psychological factors come together to motivate people to want to pay more attention to risk issues and also to spend more effort thinking through existing information. This process also includes identifying additional sources and alternative opinions, not just relying on one set of information but actually doing a little bit more cognitive thinking to figure out what is accurate, what is valid and what is not. So I think interest is very much at the core of the model, and it could also be generalized to apply to more than just risk topics. In fact, [one of our risk meta-analyses](#) that we did a few years ago found that risk perception is not really the big driving force within this model at all. It's really the connection between the idea of norms that I just mentioned and also people's innate need for knowledge. Those seem to be stronger predictors of the motivation for information seeking and processing.

What does a typical information-seeking study or project look like? How do you operationalize the concepts and study them?

The central concept of information insufficiency is usually measured through survey studies. It's actually a fairly simple set of measures. There are usually two items, one that asks participants or respondents to assess their existing knowledge about the topic. We usually ask people to self-report a number based on a 0 to 100 scale. Then we ask them exactly the same type of lead and ask them to tell us how much they would need to know about that particular topic, using the same scale. So it's a two-item assessment strategy asking people about their subjective knowledge first and then asking about their subjective information sufficiency threshold. After controlling for current knowledge,

basically what's left over in terms of information insufficiency is what we would need in order to assess its correlation with other variables, such as information seeking and information processing.

There are some issues with this measure. In several studies, we actually observed a pretty strong ceiling impact in which people feel that they want to know all there is to know about a topic, especially when it's an unfamiliar topic such as climate change or cancer clinical trials, which was related to my dissertation research. Basically, everybody reports a very, very high threshold because there is very little baseline knowledge. So in that situation, statistically it could really run into difficulty in terms of capturing the meaning of this concept. Based on this problem with measurement, in some of my more recent research I actually experimentally manipulated this information insufficiency idea. In one study that I did with [Laura Rickard](#) and several other scholars at SUNY-Albany, we focused on climate change, and then we actually used this experimental manipulation to trigger a stronger or weaker sense of confidence. I think it was a pretty interesting idea. What we did was we asked people to take a fake proxy knowledge test about climate change. I had some degree of knowledge about climate change given that it's such a prevalent topic in the media. After this knowledge test, regardless of their actual score, we gave them a prompt. We told a certain group of the people that 80% of the participants got eight questions right, but unfortunately they only got two of them right. We tried to manipulate and make them feel less confident about their existing knowledge. Then for the other group we did the opposite. We said that 80% of participants only got two questions right but that they actually got eight questions right, and we congratulated them. It's simple manipulation, but we definitely saw that people who were put in the highest sufficiency condition reported a lot more confidence in how much they knew about climate change. This kind of experimental and manipulator-induced information insufficiency actually influenced their subsequent information processing. We gave them a news article to read about climate change, and based on self-reported

measures, people who had a stronger need for more information or greater information insufficiency seemed to spend more time and definitely dwelled on the message a little bit more.

How do you think information insufficiency and information seeking differ from questions of personal identity or motivation?

I think they're definitely different from personal identity. We actually don't look into individual characteristics, traits, or specific reasons that lead people to pay more or less attention to a topic. It's part of the model, but it's really not a focus of a lot of studies. Those concepts are basically controlled for and treated as covariants to rule them out. Information insufficiency and information seeking are definitely not an identity issue, because interest is very much individualized. We might be interested in certain things but not others. In terms of motivation, there's definitely a lot of overlap or similarities, because the way that we've been studying or researching interest is really trying to figure out what it does in terms of influencing information seeking and processing behavior. We definitely treat this interest as a new kind of variable, trying to gauge how, for instance, we can elevate that interest in certain segments of the population so they can pay more attention to the things that we, as scientists and experts and other types of authorities, believe that it would be to their benefit to learn or to know more about.

How can people use the information from your research to make smarter communication decisions?

Here's an example from another study I just conducted with a graduate student. She was studying e-cigarettes, which we know is a risk factor for adolescents especially. They can lead to smoking regular cigarettes, and there are a lot of harmful effects of e-cigarettes themselves. In this study, we tried to distinguish objective knowledge from subjective knowledge. In the risk framework that hasn't really been done, because everything is based on this very subjective evaluation of how much you know and how much you think you need to know.

In this study, we collected some data that seemed to indicate there was a really big discrepancy between objective and subjective knowledge. Both sets of knowledge definitely influenced behavior intention in terms of wanting to try e-cigarettes in the near future. What's interesting is that we found current e-cigarette users or people who have tried them before definitely perceived themselves to have a very high level of subjective knowledge. But that perception was directly contradictory to their performance on real knowledge test questions. So people who think they know a lot might actually not know much at all. I think that could have practical implications for improving communication about science on risk topics. I think it's a mundane thing to say "know your audience," but I think it's always good to assess baseline knowledge to see what people actually already know about a specific topic, because that really influences your assessment strategy. You don't want to just bore people with the same old information they already know, especially with a lot of risk topics like climate change. Everybody knows certain things or believes that they know a lot because they hear so much about it, so you need to identify new angles to talk about it. You need to trigger that sense of interest or get people to go, "oh, that's a new angle I haven't heard of," and you need to understand what information insufficiency is present that could potentially be a useful tool to develop campaigns or informational materials to address those issues.

Where is this type of research is going, in terms of trying to motivate people's sense of information insufficiency or sufficiency to get them to change their behavior?

I think our RISP model has been really fruitful in terms of generating empirical research. I keep seeing new studies that are coming out in different domains and different topics. With regard to the meta-analysis I mentioned earlier, which I conducted with my colleague, [Thomas Feeley](#), here at Buffalo, I think that similarity of the risk topic seems to be really important. The model overall seems to perform much better when the person being surveyed has some degree of familiarity with

a risk topic. I think it's probably just easier for people to gauge their existing knowledge, whereas when the risk topic is unfamiliar to the potential audience, the model really doesn't seem to perform as well. I think in terms of this theoretical boundary, we need to look into conditional factors, like what risk topics really afford greater accountability. We need to be able to explain or account for those variances in those risk issues and maybe not so much in others. So I think researchers who are interested in the risk should definitely look into that condition a little bit more carefully in terms of the overall model. For example, we need to determine how much variance to account for, because when we did the meta-analysis the range was really, really big. Some studies account for 5% of variance, while others account for 75% variance. Basically, a big variance tells you that there seems to be something else that really influences the overall performance of the model to help us really think about information seeking and processing.

Overall, if you wanted to make somebody seek out information, what would you do?

There are a couple of things you can do. If it's risk-related information, you might start by looking into risk perception in terms of severity, susceptibility, and emotional reactions to the risk topic. Those perceptions are at the very core of what triggers that information insufficiency. Within the overall model those are the variables, they're the antecedents to information insufficiency. So I think it's always important to look into what constitutes risk perception, not only cognitively, based on numbers and statistics, but also how people emotionally react to the risk topic. In addition, there's the norm idea I mentioned earlier. In study after study, we see that one single variable seems to be very powerful, influencing how much people think they need to know about a topic. We're all social beings; we don't just live alone, we don't just take care of our own innate cognitive needs. A lot of our feeling about our own information sufficiency is really based on what other people expect us to know. The social influence and people's reference groups are important. So I think those two key variables, risk perception and social factors, can induce greater insufficiency and make people want to seek out more information.



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