Using MOST to Improve STI Prevention  
with Kari Kugler & Amanda Tanner

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In this podcast, we discuss the application of the [multiphase optimization strategy (MOST)](https://methodology.psu.edu/ra/most) to the development of an online intervention to reduce sexual risk behavior among college students. Host Aaron Wagner speaks with [Kari Kugler](https://methodology.psu.edu/people/kkugler), Methodology Center investigator, and Amanda Tanner, assistant professor of public health education at University of North Carolina at Greensboro (UNCG), about the project which is funded by the National Institute on Alcohol Abuse and Alcoholism.

In this study, the researchers will use MOST to strengthen intervention components aimed at reducing risky drinking, risky sex, and their co-occurrence, and then using the strengthened components to form an optimized intervention. The principal investigator of the project is Methodology Center Director Linda Collins. David Wyrick, associate professor of public health education, leads the team at UNCG.

Speaker 1: The Methodology Center Perspective podcast is brought to you by the Methodology Center at Penn State, your source for cutting-edge research methodology in the social, behavioral and health sciences.

Aaron Wagner: Hello, and welcome to "Methodology Minutes." I'm your host, Aaron Wagner. With me today are Kari Kugler, Research Associate at the Methodology Center, and Amanda Tanner, Assistant Professor of Public Health Education at the University of North Carolina, Greensboro. They're with me today to discuss a newly funded project from the National Institute on Alcohol Abuse and Alcoholism. They're part of a research team that is constructing an online intervention, targeting the link between alcohol use and sexual risk behavior among college students. This project is being run through the Methodology Center because the researchers are following the multiphase optimization strategy, or MOST, a framework for optimizing interventions. Kari, Amanda, welcome.

Kari Kugler: Thank you.

Amanda Tanner: Hi, Aaron.

Kari Kugler: Glad to be here.

Aaron Wagner: Amanda, could you start us off by explaining what is the public health problem that this work is addressing.

Amanda Tanner: Sure, the issue that we're trying to focus on is the reduction of sexually transmitted infections or STIs among college students by focusing, as you mentioned in the introduction, on alcohol use and sexual behaviors. This is important because we know that on college campuses, students are drinking, particularly in their first year, and this is also a time where there's more sexual exploration. This is often the first time that people are away from their families, and so what we're really trying to do is look at what's happening at that intersection to help promote healthy sexual development among young people.

Aaron Wagner: Great. Just a little more specifically, and we'll get into this later. Where do you guys come in? You're looking at sex and drinking. Specifically what?

Amanda Tanner: Right. Okay, so what we want to be doing is looking at that transition, right? From high school to college, we're focusing on first year students. We see a high prevalence of STIs among college students, and so what we're going to do is develop this intervention to help reduce high levels of drinking. We know that when people are drinking, they tend to maybe not make the best decisions around sex, so we're really trying to focus on increasing condom use, so that we can help prevent the STIs. Also, for heterosexual couples, to reduce unintended pregnancy.

Just making this be a part of their sexual repertoire more generally. At the same time, there's been this focus a lot on college campuses around the hookup culture. Hookups have been defined sort of broadly as casual, sexual interactions with no real commitment in a sort of traditional relational context. What we're hoping to do is reduce the number of hookup partners that individuals are having.

Again, these tend to be a little bit, I don't want to say risky per se, but higher risk behaviors because there tend to be more alcohol that's used ahead of those interactions. Because the partner's not known, some of the conversations that, as a public health professional, we really try to encourage is knowing your status, communicating about it, negotiating condom use. There doesn't tend to be that same level of familiarity, and so oftentimes those conversations aren't happening. Even if condoms are used, there's still a potential that they're less likely to happen with newer partners.

Kari Kugler: One aspect of our intervention is focusing on building those skills around condom use negotiation, and just strategies that you can use to reduce your amount of alcohol use, not put yourself in that position.

Aaron Wagner: Sounds like a steep hill to climb, but important work to be done.

Amanda Tanner: Yes.

Kari Kugler: Highly prevalent behaviors on college campuses.

Aaron Wagner: Yeah, I've heard of that. As I mentioned in the introduction, you'll be following the multiphase optimization strategy, or MOST. For listeners who might not be familiar, could you give us a little introduction to MOST?

Kari Kugler: All right so what is MOST? MOST is an engineering inspired framework developed by Linda Collins and colleagues over the last 10 years to build more effective and efficient behavioral interventions. Why do we need more effective and efficient behavioral interventions? Let's take the traditional approach to development and evaluating of our interventions, oftentimes evaluated with a two-arm, randomized control trial. Say a behavioral intervention had five different intervention components, and we find out at the end of the day that using the evaluation of what I'm calling a two-arm RCT, that it has a statistically significant effect on our outcome. We're very excited about that, but I think that there's some important research questions that we don't know.

We don't necessarily know whether all five components are needed to come together to have that effect on that outcome. It might really only be driven by one or two of those components, and three are really just kind of wasteful. Or if at the end of the day we find that we have non-significant results, we actually know even less. We don't know whether or not all five of those components are just completely worthless or that one had a positive effect that was negated by the negative effect.

MOST allows us to have a systematic and efficient approach to determining what's going on in our interventions, to know whether or not all five of our components, in this case, are actually having an effect on our desired outcome, if they're having a combined effect and that even has a better effect on our outcomes. It's a systematic approach, very principled approach, inspired by engineering that allows us to do that.

Aaron Wagner: You're looking at all the different parts that go into building the intervention ...

Kari Kugler: Mm-hmm (affirmative), yeah.

Aaron Wagner: ... It's enabling you to tease apart what's working and what maybe isn't.

Kari Kugler: Absolutely, and then by doing that, we hope that we have an optimized intervention, or the best available intervention given these constraints of saying that they all have to be working.

Amanda Tanner: For this particular project, this is exciting because men and women may have different norms around sex. Oftentimes, women are expected to be the gatekeepers, the ones to say, "No." The ones who are supposed to be controlling men's behavior. Again this is a gross generalization and stereotype, but the message that they may need to hear may be slightly different from the male students. MOST allows us an opportunity to both look at these individual components and look at how the effect may be different for male students and for female students. In the revision process, if we need to change things just for the female students, this allows us to do that.

Aaron Wagner: That's very cool. We talked a little bit about what MOST is. Where else is MOST being applied?

Kari Kugler: We're definitely seeing some uptick of using MOST, and really to try to target lots of public health issues. The flagship study that was done using MOST had to do with smoking cessation. It was a clinic-based study looking at different phases of smoking cessation, but really looking to see what components are effective in the pre-cessation phase, the cessation phase, and even maintenance phase. That was a clinic-based study using pharmaceuticals in addition to behavioral strategies such as counseling.

We've also seen it being used in weight management. This is more of an online format on a remotely delivered intervention, but we've seen it in weight management control. There are studies around depression that are trying to use this, and we are using it in the context of college students looking at alcohol use and sex.

Aaron Wagner: Really cool. Amanda, why is your research group interested in following MOST?

Amanda Tanner: Well, that's a good question, Aaron, and I think it speaks to this long collaboration that Linda has had with my colleagues at UNCG, who are all a part of this project, David Wyrick and Jeff Milroy. They've been working for the last several years on using MOST and its application to their project called My Playbook, which is an online alcohol and other drug program specifically for college athletes. They've been really pleased with the process, which allows them to revise individual components based on their conceptual model, and really make and create the most efficacious intervention that they can.

This project is an extension of that collaboration where Kari and I were asked to be part of the team because we bring in the sexual health expertise and complement David and Jeff's expertise around alcohol and Linda's and Kari's expertise around methods. We've been excited about this process, and Kari spoke to this a little bit, where we can use these individual components to see where we can make the most difference in terms of what our outcomes are.

Again, it allows us a lot of flexibility in terms of tailoring by gender. We're also working with several universities within the screening experiments, and so we're working with a junior college, a mid-size state institution, and two historically black colleges and universities. We have a really diverse student population with different campus contexts, so in terms of alcohol use norms, sexual behavior expectation. The gender ratio on the campus is quite different, and so this really allows us to tease apart how some of those contextual variables may actually affect our intervention, and make sure that we're making revisions based on the larger needs of the institutions that we're working with.

It's been, I think, a really strong and great collaboration to be able to work with Linda and Kari both in terms of the different expertise that we have, but also just in terms with how well we all work together, and so the process has been really fun. We both, we get together in person. We've been meeting in D.C. Kari's come down to North Carolina and then now, we get to be up at Pennsylvania and really have these dynamic and energetic long meeting days.

Kari Kugler: Yeah, and I just wanted to back up a little bit in terms of, you mentioned the conceptual model and how that's really been the driving force for how and why we're even coming to the point of using MOST. One thing that I think is a unique strength of MOST is that we are able to look at our conceptual model and say, "How do we think potential mediators are related to our outcomes?" And specifically design intervention components around to target those particular mediators. Our conceptual model is really helping drive what we think we need to be including into our intervention or our overall optimized intervention.

Aaron Wagner: Great, so talk to us a little bit about what specifically you're going for. You mentioned the mediators you were targeting. What mediators are you targeting? How are you going to climb this steep hill of getting kids to drink less so that they make better decisions in sexual situations?

Kari Kugler: For instance, we're targeting descriptive norms. What are descriptive norms? This is the perceptions that we carry around, the prevalence of particular behaviors, so alcohol use or sexual risk behaviors after having drank alcohol. Another one that we're targeting is something called injunctive norms. Again, these are the perceptions that we have of the approval of those behaviors. A third component that we are targeting is expectancies that individuals have regarding particular behaviors. For instance, "After drinking alcohol, I will be a better performer in sexual behaviors," for instance, so "I have the expectation that I need alcohol in order for me to have a better sexual experience." That's an expectation I might have.

We're trying to challenge some of those expectations. The notion that you don't necessarily have to have as much alcohol in order to have that outcome, so challenging some of the expectations or the other one that we're framing it as a self-efficacy to prevent harm. What are the strategies that we can be using? Such as decreasing the amount of alcohol we're consuming, being around friends that will help us reduce the amount of alcohol we're consuming so that we could then not have the outcomes of sexual risk behaviors that put us at risk for STIs. Those are the four particular components that are driven. They're very proximal factors that are driven to then have an influence on behavior, would then, would have an influence on our outcome of STIs.

Amanda Tanner: I think one of the things that's most exciting for me about this project is that often for these types of programs for college students, they tend to focus just on alcohol use, or more recently, they'll be focusing just on sexual assault. What we find is that it's really hard to tease apart those behaviors for college students, right? The drinking often leads to sex, or people are motivated to drink more so that they can be participating in certain types of sexual behaviors or they're using alcohol or going out to go find a hookup partner. This really allows us to focus in at the particular intersection, which we know is really important for college students.

Kari Kugler: Yet, has not been really well-studied in previous literature, previous studies.

Aaron Wagner: Yeah, great. Why is it online?

Amanda Tanner: This is an important question, and I think there's a couple of different reasons. One is that we want to try and make it so that we have some control over the way in which it's administered, so there's fidelity to the programing itself but also in terms of being able to make something scalable. We've asked all of our participating universities to require or mandate, if they can, that all of their incoming first year students participate in this program.

If we were going to try to do this in a face-to-face way, we wouldn't be able to do this for thousands of students with one individual, so this would make the program much, much more expensive. It also then allows us the ability later on to be able to make it something that we can market to other institutions, keeping that same fidelity. Ideally, the goal is to be able to move outside of the college communities to work with other populations who are at increased risk for alcohol use and STIs.

Aaron Wagner: Thank you. I have a question for the benefit of researchers who don't study sex. When I was writing about this grant earlier, not really to do this podcast, you two ganged up on me because I used the term, quote, "risky sex." What in your view is wrong with saying, "risky sex," and what should we be saying?

Amanda Tanner: Aaron, I am so glad that you're asking us this question. I think it's really important. I think that, for me, as somebody who really focuses on sexual health promotion, that a sexual behavior in and of itself is not inherently risky. It's the context surrounding it that actually makes something risky, right? If we talk about condom use, an unprotected sexual event may or may not be risky depending on what the status of the relationship is, if both people are monogamous, they know each other's status.

Perhaps if it's a heterosexual interaction, one of the ... The female partner is on a hormonal contraception, that, not using a condom is not risky. If people are going out to a bar, they don't know each other, they have an unprotected sexual event, that then would label something that's potentially risky, but the behavior in and of itself isn't risky.

The other thing I think that when we talk about sex, particularly in U.S. society, we tend to be really sort of sex-negative. One of our particular goals of this project is to say that sex isn't bad. It's a normative part of an individual's development.

Kari Kugler: We are sexual beings.

Amanda Tanner: We think that that piece is really important, and so we don't want to add to that pervasive message that sex is something that's bad. We want the message to be that sex can be fun and safe, and so we are learning and sharing. Educating as many people as we can about this is something that's really important.

Aaron Wagner: I was aggressively educated.

Amanda Tanner: You were a good learner. You were a fantastic-

Kari Kugler: You were a good absorber of all of our information.

Aaron Wagner: Kari, what else should listeners know about MOST?

Kari Kugler: Oh goodness, this is a fantastic question. I think what is emerging from the times that we've been out there, talking about it, and sharing, and listening to other behavioral interventionists, is that this very flexible and it's not, I mean, it is a different paradigm, it is a different approach to intervention development. I think it's more inclusive than people think it is exclusive.

As people are opening their minds and this idea is getting out there, it's very exciting I think. I think that we're going to only see more and more adoption to it. To use the phrase, "I have drank the Kool-Aid," and it's very hard for me to approach any other intervention without having a MOST framework in mind, because I think that there are questions that need to be answered that we have not yet tapped into, and this approach allows us to do that.

Aaron Wagner: Amanda, my understanding is that you and Kari being passionate about the same things may not be totally random, that you have some commonality in your background that may explain some of the overlap between you two in your research, huh?

Amanda Tanner: Yeah, yeah. Yes, actually it was one of the things that when I was first invited to be on the team, because this was a project that Kari and Linda and David and Jeff had worked on before, is that I was given the bio sketches of Linda and Kari, and I saw that we were both alum of the same undergraduate institution St. Olaf College in Minnesota, and that we also worked with similar people at the University of Minnesota, which is where-

Kari Kugler: I did my post-doc.

Amanda Tanner: ... Kari did her post-doc and where I had just done some work when I was at Hopkins doing my post-doc. It was exciting for us to be able to have that sort of geography and that commonality.

Kari Kugler: Yeah.

Amanda Tanner: We also both ride bikes and so this is another important connection for us in terms of really making the team feel cohesive.

Aaron Wagner: This leads me to my final question. A very, very important and serious question. On a scale of 1 to 10, how much fun are you guys having working on this grant?

Amanda Tanner: 11. Yeah, this has been really a fantastic team. I've mentioned it and alluded to it earlier. I refer to Linda as my best friend. Kari and I talk every week.

Kari Kugler: Mm-hmm (affirmative).

Amanda Tanner: At least once, so it's been something that's been really exciting. I think we're all learning things.

Kari Kugler: From each other, on a daily basis.

Aaron Wagner: Amanda and Kari, thank you very much.

Amanda Tanner: Thank you.

Kari Kugler: Thank you, Aaron.

Amanda Tanner: It was a lot of fun.

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