# HealthWise South Africa

### with Linda Caldwell, Ed Smith, and

### Linda Collins

### Linda CaldwellEdward Smith

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Host [Michael Cleveland](http://methodology.psu.edu/people/mcleveland) interviews [Linda Caldwell](http://methodology.psu.edu/people/lcaldwell), [Ed Smith](http://methodology.psu.edu/people/esmith), and [Linda Collins](http://methodology.psu.edu/people/lcollins). They discuss the history and future of HealthWise, a comprehensive risk-reduction, life-skills curriculum for adolescents in South Africa. The new phase of HealthWise is testing the effectiveness of the intervention's components. Ed Smith is the associate director of the [Prevention Research Center](http://www.prevention.psu.edu/) at Penn State; Linda Caldwell is a professor of Recreation, Park and Tourism Management at Penn State; and Linda Collins is the director of The Methodology Center.

**Podcast Timeline:**

00:00 - introductions

00:47 - overview of HealthWise and project site

06:02 - experimental conditions in the new phase of HealthWise

12:38 - factorial experimental design

15:40 - powering a factorial experiment

17:00 - project time line

Speaker 1: Methodology Minutes 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.

Michael: Welcome to Methodology Minutes. Today I am interviewing three scientists from Penn State University. These three, Dr. Ed Smith, Dr. Linda Caldwell and Dr. Linda Collins are collaborating on an exciting new research project that will examine the type 2 translation of an evidence-based intervention in South African schools. Ed is the associate director of the Prevention Research Center here at Penn State. Welcome Ed.

Ed Smith: Thank you.

Michael: Linda Caldwell is professor of Recreation, Park and Tourism Management and the director of the College of Health and Human Development's Global Leadership Initiative at Penn State. Welcome, Linda.

Linda Caldwell: Thank you.

Michael: Linda Collins is professor of Human Development and Family Studies and of course the director of The Methodology Center. Welcome Linda.

Linda Collins: Thank you.

Michael: As I mentioned, I'm glad to have all of you here today. I wanted just to start by having one of you just give us a brief overview of the project and maybe talk about some of the research questions that you will be addressing in this research.

Linda Caldwell: We're really excited about this project. We've been in South Africa for about 10 years now. Our goal, we originally started with a conference to address adolescent risk behavior and health promotion in South Africa. From that initial conference, we've grown and have developed a wonderful partnership with collaborators from the University of the Western Cape and Cape Town University in Cape Town, South Africa.

Over this time we've grown a project that's called HealthWise South Africa. The purpose of HealthWise South Africa generally is to reduce substance abuse, reduce sexual risk behavior and violence in adolescence in South Africa. We have the curriculum called HealthWise South Africa which is given to 8th and 9th graders. Over the years we've had some success with that in terms of the outcomes that were interested in reducing risk for substance use, sexual risk and violence.

The unique part of HealthWise is that it's based in free time and leisure. Not only is it a risk reduction program, it's also a promotion program and youth development program which the idea is that through better use of leisure time the kids will reduce the risky behaviors.

Michael: Okay. Then how about the current project? How is it building on that?

Linda Caldwell: The current project is because we have had relative success in the past 5 years, we had an effectiveness trial in the past 5 years with good outcomes, this next project is to roll out the curriculum. We've been in 9 schools - 4 experimental, 5 comparison and control schools. Now what we want to do is roll that out into 56 schools in the area. We've been in one what's mixed race or colored area in South Africa right now. We're going to roll that out to 56 schools in a variety of soci0economic brackets.

Michael: Great. Before we get into the details, I wonder if you could maybe just stop to mention maybe some of the collaborators that are working together on this project. It sounds like it's a large group of people who are all getting together and working together.

Linda Caldwell: Yes. We have a huge collaborative team. This is one of those kinds of projects that couldn't be done without a lot of different areas of expertise. Ed Smith who is the co-PI on this project and Linda Collins for her methodological expertise, John Graham for his statistical and methodological expertise and Damon Jones for his area in cost-effectiveness. That's the Penn State crew essentially.

Ed Smith: Mary Lyon is the project coordinator of this project as well.

Michael: Great.

Linda Caldwell: Then from the South Africa side, from the University of the Western Cape we've got Lisa Wegner who has been with us all these years working with us. Joachim Jacobs is a new person on the team. He's going to be actually running the on-the-ground part of the project and Tanya Vergnani who is the HIV/Aids director for University of the Western Cape and then Catherine Matthews is at University of Cape Town. She is a collaborator on the project as well.

Michael: Wow. It sounds like a very solid team.

Linda Caldwell: Yeah. It's a big team.

Michael: Good. You mentioned in your introduction of the project a little bit about the HealthWise program. You gave us some details on that. I wonder if you could back a little bit and have a little bit more detail about what you have been doing and where you have been conducting those studies. Can you maybe describe some of the schools that HealthWise has been conducted in South Africa?

Linda Caldwell: We're in an area called Mitchell's Plain South Africa which is geographically in an area known as the Cape Town Flats. It's outside of Cape Town proper and really was a product of the apartheid era where basically people were systematically removed from where they were living and with the idea of dispersing them so that it would create economic dishevelment. This area that we're in as I mentioned is more of a colored area which is really again a product of the apartheid era but it's people of mixed race. They're living in cinder block houses not very well off financially. It's of course an area of great concern with HIV/ Aids and substance use so we've been in those particular schools.

All of the 9 schools that are in the study have come from that area called Mitchell's Plain. We will be expanding further in the Mitchell Plain area in this new project.

Michael: Maybe bring this to the next major point that we can talk about is how does this new project specifically build on the earlier studies? The earlier studies have been found to be having an impact on student outcomes. Then now what do you propose to do in these next series of studies?

Ed Smith: There's really two purposes of this next, we're calling it HealthWise 2. HealtWise 2 is intended to move forward in the sense of not just having a more diverse population than what we had in the first projects. Now in the 56 schools we're going to have, probably about 3/4 of the population will be Black African whereas the other one was almost all mixed race African. There's that element to it in trying to make sure that it works with different populations.

One of the key points of the project is to try to understand the impact of different variables on implementation quality. That's where this notion of a type 2 trial comes in is that type 1 trials are really aimed at trying to develop a program that has some impact on the objective at hand but the type 2 trials that we're working on are really more concerned with trying to assure that the program can be implemented with fidelity when it's outside of the developer's hands.

Michael: Outside of those very controlled conditions of the initial ...

Ed Smith: Exactly. That's why we have some of these schools in basically 3 different conditions. Basically what we're thinking is that, and these are very, very practical questions. The questions are how could you best take a program such as HealthWise have it delivered effectively in schools and do it in a way that's cost effective?

We worked with a school system there to try to understand what would the school system do if they were trying to maximize their impact on teacher performance. The way in which teachers are normally trained in this setting is that they have basically a day and a half of training on any new curriculum. On a Friday afternoon they'll get trained and then on a Saturday morning they'll come back and get some more training. That would be their standard way.

Then the question is could they actually do a better job if they have more training? During HealthWise 1, we evolved to the point where we had an extended training period.

Michael: Beyond the day and a half.

Ed Smith: Beyond the day and a half. The way that ended up working out was there was usually 2 days of training upfront and they took the teachers away to a decent place. There was nice meal and in some instances they actually stayed overnight. Then after that 2-day training they came back and trained them additionally later on during the year, sometimes once on some of the lessons dealing with free time and sometimes the second time dealing with sexuality issues.

Michael: These were new topics that were covered not just recovering again ...

Ed Smith: Well they're covered during the first 2 days but they need more attention. These are the two areas that we found under HealthWise 1 that teachers were having the hardest time with. What we're doing then in this HealthWise 2 is to vary that teacher training. It's one of the variables we're going to vary.

The other thing that we're going to vary again a very practical question that's raised by the schools is the question of how much support can teachers receive and how much can the schools afford to provide extra support to the teachers during the year. What we’re going to do then is that variable if you will is going to be experimentally altered so that some schools will get increased teacher support and some schools will get standard support if you will.

The standard support is that if a teacher calls back to the trainer and says "Look I don't know how to do this", we're not going to not give them that answer. Of course we're going to do that but in this instance we're actually going to go out of our way to contact teachers, ask them if they need support or to provide clues to them about how to better deliver our lesson and that sort of thing.

The third variable that we're going to vary is the amount of support that the environment provides.

Michael: The school environment?

Ed Smith: To the school, right. In the school now the question is, and we're not just talking posters or something such as that but the posters will be an element of it. The idea is that the schools should be identified as a HealthWise school that everybody in the school knows that the program exist, that the other teachers know about it, that the principal is trying to provide ongoing support for the teachers and that parents will be involved. We'll try to engage parents. There are these boards that schools have in South Africa that are ... They're not really governing boards but they're advisory boards to the principals. These are usually consisted of community members, family members and other interested people. These boards will become part of this engaged school environment and we're going to try to get them try to alter that also so that some schools will get this increased environmental support and some schools won't.

Michael: Sure. Very interesting design then to manipulate those three factors.

Ed Smith: Yeah. These three factors really are factors that in the long run could be self-sustaining. Any one of these we want to make sure are factors that are not things that we dreamed of but they're really potential ways that the school administration could in the long run provide better implementation quality of a program such as HealthWise.

Michael: That seems to be the main process of this is that the idea of the science of implementation, how can we best address that question, what are the factors that impact implementation of programs.

Ed Smith: Right. That is the primary objective of this program. I was interested in writing the script because we said "Okay, these are our primary hypotheses but in the long run we still want to see the impact on the kids.

Michael: Right, so you have a second one.

Ed Smith: We have a set of secondary hypothesis that work through the primary hypothesis that is the impact on the teachers but then in the long run does that also work its way down to the level of the kids such that their behavioral changes are in the direction we want as well.

Michael: This really sounds like it has potential to be a very impactful led-mark study to understand all of these factors within one project.

Ed Smith: We hope so and it confuses the heck out of me.

Michael: Well to help clear up some of that confusion, I assume that's why you brought Linda Collins along who helped design this. I like to turn next to Linda and ask a couple of questions. How did you propose to assess the impact of each of these factors?

Linda Collins: We're in a really unique position here because we have 56 schools we can assign to experimental conditions. We decided that we wanted to conduct what's called a factorial experiment. For folks who aren't familiar with factorial experiments, in factorial experiments you manipulate several independent variables at a time.

Ed mentioned what the experimental variables are that are being manipulated. There's three, there's the enhanced teacher training, the additional teacher support and then the enhanced school environment. Each of those can be either on or off. If you look at all the different combinations of those being on or off, that's actually 8 experimental conditions. This would be called, for people who do know about factorial experiments a 2 by 2 by 2 factorial experiment.

Now there's a prevailing sentiment out there in people who conduct experiments in the field that you can't even consider conducting a factorial experiment in the field because there's too many experimental conditions to keep track of. One of the things that I hope we do and I think we will do in the study is just prove that that's wrong because it is possible to conduct if you're careful to conduct 8 experimental conditions. This is going to enable us to learn so much more than the alternative.

The alternative would be to, and this is I think probably what most people would do to use a design that's often called RCT, Randomized Controlled Trial where in one condition each of these 3 factors would be turned on. Half the schools would get the enhanced teacher training and the additional teacher support and the enhanced school environment and then the rest of the schools would get none of those things.

Well that would enable us to compare the effect of all of the 3 factors together but it would not enable us to look at the individual effect of each of the factors. It also would not enable us to see whether any of the factors interacted with each other. By interacted with each other I mean one factor say has a much larger effect in the presence of another factor. Maybe 2 of these factors have a synergistic effect. The two together is perhaps much more effective than just what you might expect by adding up the main effects.

We're going to get a lot more information in exchange for taking the trouble to conduct 8 experimental conditions instead of 2. I think that the contribution to science is going to be a lot greater here because we're conducting a factorial experiment.

Michael: With so many conditions, did you have issues with power? I can't remember exactly how many schools you mentioned. You had 56.

Linda Collins: That's a great question. No, we don't and the reason is that factorial experiments actually are extremely powerful for certain kinds of research questions. I think another reason why people don't consider using factorial experiments is because there's a myth that factorial experiments require huge numbers of subjects, on this case an entire school as a subject but that in most cases is not true.

Now it depends on the research question and the design. It always has to be appropriate for the research question. You can't really talk about the power of a design in absolute terms but for the kinds of research questions that we're asking here suppose we decided to do 3 separate experiments - one to look at just enhanced teacher training, one to look at just the additional teacher support and then third one just to look at the enhanced school environment. That would take 3 times as many schools as this one factorial experiment takes.

That's an example of how efficient factorial experiments can be in terms of use of subjects. That was really seemed like the way to go here.

Michael: Sure. It does sound like it. It sounds like a very exciting project. When do things get started and get off the ground? Have they already gotten started?

Linda Collins: It started.

Ed Smith: It started. Actually we're modifying our application a bit because we realized that trying to get things running right away with 56 schools was going to be too much of a challenge. On top of that we were a bit concerned about the fact that this program has never been attempted in a Black African school.

What we've decided to do during the first year is going to pick 2 schools that are representative of the kinds of schools that we will be in. In fact those schools are about ready to be signed on board. In those schools we're going to run what is probably the most difficult of the conditions. That is where they received all three of these characteristics.

There's two things that are going to happen there. One is that it will help us get sharper with making sure that we can keep these things unique and separate. Then the second is that it will give us an opportunity to make sure that it works with teachers in these different environments which are usually a little bit more challenging than the environments that we're in before. Hopefully it will work out.

We've also added, because we have to monitor the teaching process we're also going to try out our system of doing that monitoring which involved teachers' logs, teachers' surveys and teacher observations. Then we've also modified our data collection instrument with the kids. I think we're going to end up using netbooks with audio hookups and we haven't used that before. In the past we've used handheld. This will be a little bit more sophisticated.

I think this first year is really going to be a great way for us to make sure that all these pieces are working. That will begin in January and then the following January is when we kick off the big trial.

Linda Caldwell: I just want to add something about I think one of the things that we're very concerned about in terms of methods is the observation component because in this culture and environment it's going to be very difficult to logistically setup ways in which it observe the teachers. Because that's the gold standard in understanding implementation quality, we really need to make sure that we understand how best to work with the teachers in the schools and what kind of equipment to observe the teachers.

The other reason that it's important for this first year's semi-pilot is that the curriculum has not ever been used with Blacks South Africans either. We don't know to the extent that that may need to be modified.

Michael: There was a level of adaptation I assume before and then maybe ongoing as you go forward ...

Linda Caldwell: A process of adaptation ... Yeah, exactly. In fact we're ramping up a couple of the lessons where we have identified potential issues that we need to do a better job with some of the lessons currently. We're doing a little bit more with those. There's all sorts of reasons for trying out a semi-pilot first.

Michael: Sure. That does sound very reasonable I think to get that ironed out first.

Linda Caldwell: Right.

Michael: Well I'm looking forward to hearing more about this and seeing some results.

Linda Caldwell: We are too.

Linda Collins: Yeah.

Michael: I assume.

Linda Collins: Yeah, definitely.

Michael: I'll be very interested in hearing more.

Linda Caldwell: Thanks.

Michael: Before I end I can't let you all go without hearing a little bit. I understand there's an interesting story that provided the impetus for the three of you at least collaborating. Can one of you offer that story?

Linda Collins: Well, we like to take vacations together. We were on a ...

Linda Caldwell: Scientists and nerds ...

Linda Collins: Scientist, right, scientists and nerds on vacation. We were on a boat in the Galapagos. I remember I was on a deck chair. We were on our way between islands. Ed came up to me with a little notebook and said "Linda and I were just talking about this study we want to do and we're wondering do you think we could do a factorial experiment?"

Linda Caldwell: Linda jumped out of the ...

Linda Collins: That's right.

Linda Caldwell: The chair and said "Yes!"

Linda Collins: "Yes, we can."

Linda Caldwell: Those are the magic words.

Linda Collins: That's right, that's right. Yes. We spent some time on that boat while we were going to the next island talking about that. That's actually where we designed the study. It's I think pretty much the same experiment, the design on that boat.

Ed Smith: Yup. Wow.

Linda Caldwell: I think, yeah. Yeah, it was.

Linda Collins: I had previously traveled. Before that trip I had traveled to South Africa with Ed and Linda and went with them to Mitchell's Plain and had a chance to see for myself. We even visited a school there. That I think has helped me to understand some of what they're up against when they're in the field. I don't go out in the field myself very often being a pointy-headed methodologist I don't want to do that but I think was really helpful for me to have some exposure to that. I do at some point in the course of this study I hope to go back.

Michael: Sure. Well thank you all for joining me today.

Linda Caldwell: Thank you.

Michael: I really enjoyed talking to you learning more about this project. As I said I look forward to hearing more about it.

Ed Smith: Great. Thanks, Mike.

Linda Caldwell: Great. Thanks. Thanks for the opportunity.

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