

78| Neuropsychology and Sub-Saharan Africa – With Drs. Jean Ikanga and Tony Stringer

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Speakers: Jean Ikanga, Tony Stringer, John Bellone, Ryan Van Patten



Intro Music 00:00



John Bellone 00:17

Welcome, everyone, to Navigating Neuropsychology: A voyage into the depths of the brain and behavior, brought to you by INS. I'm John Bellone...



Ryan Van Patten 00:25

...and I'm Ryan Van Patten. Today we talk with Dr. Jean Ikanga and Dr. Tony Stringer about the African Neuropsychological Battery, or ANB. We've already had

Tony on as a guest one other time to talk about the AACN Relevance 2050 Initiative, you can find that episode at navneuro.com/58. Tony is a board certified neuropsychologist and a Professor at Emory University. Jean is a neuropsychologist with affiliations at both Emory University and the University of Kinshasa in the Democratic Republic of Congo. In brief, the ANB was developed by Jean and Tony, was normed in the Democratic Republic of Congo, and is intended for use in sub-Saharan countries in Africa.

John Bellone 01:16



We've wanted to record this episode for a while now and hope to bring more content like this in the future. We believe that it's important that North American neuropsychologists, ourselves included, begin to expand our scope and think about neuropsychology in a global context. Of course, the goal here is not to colonialize Africa or other places with Western ideas and techniques, but to adapt neuropsychology to fit the cultures and people who could benefit from it. And we think that Jean and Tony exemplify this with their ANB project.

Ryan Van Patten 01:49



Before we get started, we want to quickly share a few resources that some of you may find to be helpful. EthnoMed.org and EveryCulture.com provide culturally and clinically relevant information about people from all over the world. We can use these websites to begin educating ourselves about our patients beliefs, traditions, languages, and other relevant topics. We will also include these links in the show notes for this episode.

And one caveat, in our virtual meeting, Jean was calling in from the Congo. The internet connection was a bit unstable at times during the conversation, and we apologize for any minor disruptions to his audio quality.



John Bellone 02:33

And, with that, we give you our conversation with Jean and Tony.



Transition Music 02:37



John Bellone 02:46

Tony, welcome back to NavNeuro, and Jean, welcome to NavNeuro for the first time. We've been wanting to have you on for quite a while, so I'm very glad to make this happen.



Tony Stringer 02:55

Thank you. It's a pleasure to be back.



Jean Ikanga 02:57

Thank you.



John Bellone 02:58

So some questions will be specific to one or the other of you, but either of you can jump in anytime to answer these. Jean, can you tell us about your journey into neuropsychology and how you became, from my understanding, the first neuropsychologist in the Democratic Republic of Congo?



Jean Ikanga 03:18

Yes, thank you for the question and thank you for inviting me. And thank you for having Dr. Stringer because asking me that question is talking about Dr. Stringer in my life. So my journey started, I'm first a Catholic priest. So when I was in the parish here, in the church, I encountered many people who were having many mental issues. And I'll never forget the story that I did share to many people - this 9-year-old young lady who was raped and the mother came to me. They were saying she was bewitched, and they asked me to pray for them. But when I heard this story, it seems that this young lady was raped by the soldiers who wanted her father to rape her. And the father refused, and they killed the father. So she was having PTSD, but I did not know. I asked a psychiatrist to see her. When the psychiatrist told me, he said, "Father, she's suffering from PTSD", their story became a story which changed my life. So that is the beginning of my journey toward psychology.

That story is not the only story, but I had many stories of people having mental issues that they were attributed to witchcraft. That's why I asked my religious order to come to do medical school. When I was in Denver, at Regis University, my professor of neuropsychology really changed my life. He told me neuropsychology would be best than to go to med school, and that's the way he changed my life. So when I was doing my grad school at Detroit Mercy, there I did a Ph.D. in clinical

psychology, but I have this interest in neuropsychology. I was so much invested in it.

And it was, I think it was at a NAN meeting that I met Dr. Stringer. In the NAN meeting, many of those I saw, I'm sorry, were mostly Caucasian. I did not see any Black person. And at that time one of the only Black [persons] I saw was Dr. Anthony Stringer. So I just ran after him and told him I wanted to meet him, and he was so busy. But what touched me was he told me, "We can find a time." And I find a time, and I saw him, and I told him my story. And when the time of applications came for internship, it was at Emory that he accepted me to do my internship. He was the one who trained me in neuropsychology there. I did a postdoc with him. I will say he's the only one in the [unintelligible] - but, not the only one, because Suzanne was there. So, he is the one who trained me in neuropsychology. And with him, we started creating tests for Africa. So this is my journey in neuropsychology.



John Bellone 06:17

Wow. That's a powerful story. You had a good trainer for neuropsychology, a good mentor.



Ryan Van Patten 06:23

If you were going to choose a random neuropsychologist...



Tony Stringer 06:25

[laughs]



Ryan Van Patten 06:25

...and happened to find Tony Stringer. [laughs] It's pretty good.



Tony Stringer 06:30

Oh, I appreciate that. But if I could just tell maybe the other side of the story, too.



Ryan Van Patten 06:34

Sure.



Tony Stringer 06:36

Jean's application was quite unique. You know, we don't usually have tears when we're reading internship applications. But Jean's story was so compelling that several of the faculty members were openly crying and, you know, I felt myself

tearing up a little bit. It was just a very compelling story. And there was no point at which we doubted that taking Jean on was the right decision to make.

Ryan Van Patten 07:01

Well, it's a great way to start off this conversation that we're having. Just to lay out a general outline in terms of where we will go from here. I think we can start by asking both of you some general broad questions about sub-Saharan African culture, and then bring in neuropsychology, and then we'll move into the African Neuropsych Battery as we get along.



So, to start off, sub-Saharan Africa is a large region geographically. It encompasses about 9.4 million square miles, 46 total countries, over 1 billion people, and certainly a great deal of cultural diversity. In this conversation today, of course, we won't be able to even come close to doing justice to the nuance of all the regional differences in norms and social practices, but we will talk in some broad strokes. So for the sake of our discussion, and with a caveat that we're oversimplifying things about here, Tony and Jean discuss some of the overarching characteristics of sub-Saharan culture and how it differs from North Atlantic cultures.

Jean Ikanga 08:10

Okay, thank you. In terms of the cultures, let me say that when we talk about Africa, we have the Sahara Desert, which seems to be like the geographical landmark. So there is the North of Africa, which is more Arabic in terms of the culture, and below the Sahara Desert is what we call sub-Saharan Africa. So in terms of geographical differences, in that sense, the culture in many of those in the south - I know, as you say, there is a lot of diversity, but I would like to talk in terms of what is common in sub-Saharan Africa. One of the first things is that sub-Saharan Africa is mostly an oral tradition culture. It is a culture where the emphasis is put on the "we", the family, rather than the "I". Another aspect is that sub-Saharan Africa will use a lot of metaphors, and will use a lot of symbols, proverbs, and stories to communicate. This culture will be more oriented to get story, rather than details. It will be a culture that would put much emphasis on the tradition and respect of elders. Another element is the aspect of religion - the Supreme Being, there is a big impact and emphasis on that. The belief of the Supreme Being goes to the belief of the Spirit and the belief of the witchcraft. And this is an element that I will give so much aspect to explain the etiology of disease for Africa. While talk about that, let me first start by giving the cultures. Another element of sub-Saharan Africa, which is very important, is the concept of time. The African concept of time, according to John Beatty, seems to be an event rather than the mathematical concept that we have in



the West. So, let me stop there, because I can explain this more. Another thing is that the culture seems to be in the education in term of a culture of “at least”, to do what is the minimum. Another thing that's very interesting in sub-Saharan Africa is men do not show emotion. So it is rare to see a man crying in sub-Saharan Africa. I won't say that men don't cry, but generally no. There are some issues in drawing. And in the concept of time, I just said about the time as an event, that has broad issues in that Africans may have some problem with organization and planning and categorization. So these are some cultures I can bring from sub-Saharan Africa.

Tony Stringer 11:09

I can add to that also. You know, the language traditions are very different. Something that we are not used to, I think, in the United States is we're used to people being monolingual. We're not used to people being bilingual or multilingual, whereas that is very much the norm in much of sub-Saharan Africa. So, Jean, I forgot how many languages you speak, but I think it's somewhere around six or seven, maybe even eight languages. Now, Jean, obviously, is someone who has advanced education. So that's not typical, but it's certainly going to be typical for people to speak multiple languages. So you're dealing with a developmentally different brain from a neuropsychological standpoint.



Jean also mentioned the oral culture as well. A question in my mind is whether or not coming up in a culture that has a very strong oral tradition, whether that, in fact, gives you a huge advantage on a memory test that uses an oral presentation format. So perhaps the norms have to be very different just because of that kind of background or that kind of practice inherent in the culture. So, we are dealing with potentially a brain growing up in a different cultural context that, in fact, may be organized and structured in ways that, at this point, are unstudied, and, in some cases, may be even unpredictable.

Ryan Van Patten 12:36

Yeah, that's a great way to start outlining some of those differences that we might not think of coming from Western and U.S. cultures, but are very important to think about if testing someone from sub-Saharan Africa, and certainly if developing a test battery for those people. So I want to just briefly cover some other aspects of culture. Either or both of you, can you touch on the educational systems in countries in sub-Saharan Africa? How developed are they? How much variation is there across systems? How educated are many of these people?



Jean Ikanga 13:10

So, let me start on some issues and maybe Dr. Stringer can add. In terms of education, I think that I will tackle it in two ways: the education before colonization, and education after colonization. So, in terms of education before colonization, the education before colonization was oral tradition - so through rituals where there was artistic performances, ceremonies, games, festivals, dancing, singing. So that is the way our elders were educating. And it was not following a step of instruction. This type of education was separating boys and girls. So there was education for boys, there was education for girls. And the goal of the education was just a passage from childhood to adulthood, so the person becomes an adult.

But after colonization, there was a schooling system which came. So now all education is organized. And there, if we start today, there are some in big towns will start with kindergarten and will have a primary school, so 6 to 8 years. And it has been shown that 52% of children, this was given in 2000, were going to primary school. This is 4 out of 10 will go to primary school. And there is what we call secondary school, which is either 4 or 6 years in some countries. And this difference will be between French- and English-speaking countries. And after that will be college, which college and university are where people can receive a bachelor's degree and a master degree, an M.D., a Ph.D. But in many universities in Africa will not have the possibility to offer a Ph.D. So many Ph.D. will be in Europe or the United States or going to other countries.



One point that I would like to bring in terms of the educational system - this is mostly, I will talk about French-speaking countries. The scale for grades is between 0 and 100. And the passing grade is between 50 and 100. So, it is not like in the United States. This is an aspect that's very important for neuropsychology. In the United States, when I was studying there, I knew that when you are in undergrad, the passing grade is 60 and up or 70 and up - so you needed to work hard. When you go, you have to aim for a B or A. That's different in Africa. In Africa, in many countries, you aim for a 50. When you have a 50, it is a passing grade. 60? You don't get a lot of people who get 60 or 70. So, it is not that people are not smart, but it is the way the culture is made and how the educational system is. That comes to a point that I've brought many times to neuropsychological tests, where we expect people to have almost everything and when the person does not have everything we might be thinking he or she is not giving the best of the efforts. So that's the point I would like to bring to [the] educational system.

In the educational system, some other barriers are languages. So, like Dr. Stringer just said, in Africa, initially someone will have three languages - initially. So it's the

tribal language, the national language, and the colonial language. It becomes so difficult, you don't know where the person is in their competence in the language. And that will come up in neuropsychology. Another aspect is the lack of facilities, the manuals, library, and educators. Another aspect will be the conflict. So, you will see mostly in French-speaking countries and in some English-speaking countries, there are conflicts, there is war. So children are going here and there with parents, they are not stable. There's corruption because teachers are not well paid. So they receive corruption from parents as a way to have a better life. Because there is - the parents cannot pay a better tuition. So in that sense, also they are not taxable. Another aspect of education is women are very young when they get married, when they are 12 or 14. People are from rural and urban [areas]. People from the urban area, those who are in big cities, seem to be better educated than those who are in the villages. So this is what I can talk about a little bit in terms of education.



John Bellone 18:15

Jean, how about literacy rates and how that might be relevant for neuropsychology?



Jean Ikanga 18:21

Yeah, so this is the question because they have shown that, mostly among women, 94 million are illiterate in sub-Saharan Africa. So this becomes so difficult in doing tests which require, for example, drawing. This makes it difficult for tests which have a lot of long instructions, which require education. Even when you're asking about the alphabet, it just becomes so difficult for them. Some tests of languages and some materials - even for fluency, when you have for fluency of letters, [words] starting with F letters, or starting with A or S, this becomes so difficult for some. Many of our tests that we give are education-loaded in Africa. And that's why, as you will see, on the battery Dr. Stringer and I created, these were some of the aspects that we were concerned [about] when we were creating the test. I don't know if I did answer your question.



John Bellone 19:29

Yeah, you did. You clearly had quite a few challenges in developing this battery, which we'll talk about more.



Ryan Van Patten 19:35

Jean, you mentioned your history as a Catholic priest. I wonder if you could talk about some of the cultural attitudes toward illness and disease as well as the use of traditional healers and spiritual remedies for illnesses in sub-Saharan Africa.

Jean Ikanga 19:49

Yeah, so allow me to give some details. So, in Africa, we believe in a Supreme Being. I'm talking about sub-Saharan Africa. We believe in the Supreme Being. And that Supreme Being, you can give him any name, but that Supreme Being is personified in small beings, which are spirits. These spirits, small spirits, are here and there. These spirits can be used by some ancestors, some elders, some other people. And, if you do not respect the culture, if you do not respect the elders, if you do not respect the rituals, these spirits can give you a kind of punishment. And that spirit can use other spirits, which are bad, which are called witchcraft - the spirit of the witches. And therefore, for Africans, the origin of every biological, mental, and spiritual disease is in bad spirit or in witchcraft. So, and mostly, the aim is misfortune. When someone has a misfortune, or there is death, it is because he or she probably did not respect the tradition, did not respect the elders. The question will come, "What did I do wrong?" So the family will consult the spirits and will consult the ancestors to say, "What did I do wrong?" And therefore the etiology of all these diseases is bad spirit, witchcraft.



Therefore, for a healing, they have to go to either one of the ancestors, someone who has good witchcraft, to see where that bad spirit came from. And if not that type of a person, they can go to the spiritual person. That's why many people who have - you see my story, I started with this young lady who came to me at the church because they would like to know where that bad spirit is coming from. And the priest - for example, let me give you a word in Lingala, a priest or a pastor whoever will be is called *nzambe-zambe* (sp?), so it is the witch of the Supreme Being. So if you are able to see where the bad spirit is coming, you are able to heal. So in Africa, when there is someone will have epilepsy, I'll just give an example, or a neuropsychological syndrome, who will call for them, they will go to a priest to a pastor, to the Imam, to whoever, because they think that he or she will be able to see where the bad spirit is coming from in order to be healed.

Tony Stringer 22:41

Let me add here also that, I think it's important to recognize the degree of transition that is taking place in Africa. I think what Jean has been describing probably applies most to rural areas where some of the contemporary beliefs are probably not dominant. But if you get into more urban areas, the beliefs are probably more in line with contemporary, modernist understandings of science and disease etiology. But I think even there, there will certainly be more of a focus on the whole person, when someone is ill, rather than just the disease entity. So someone may seek certainly Western-based science-based medical care for illnesses on the belief that it's



caused by a disease, but one may also seek spiritual solace as well, because it's the whole person who's ill and not just an organ.

John Bellone 23:39



Yeah, that's really interesting. To what degree do you think is it also generational? The older populations are maybe having more strong witchcraft beliefs versus the younger ones, I'd imagine? Just curious.

Tony Stringer 23:52



Jean, you're the best person to answer that one.

Jean Ikanga 23:56

I think the answer is what Dr. Stringer said. The young generation today seems to not, I will say many of them will not still buy it. But whenever they are very sick, they still sometimes go back to it. So I'll just give an example. Dr. Stringer and I saw someone, a very well-educated physician, who was having epilepsies in Atlanta. But before we went to the clinical interview, I told Dr. Stringer, I said, "I think since she's from Africa, let's ask her whether she thinks that this is witchcraft." Dr.



Stringer said, "No, we don't need to. This is someone educated. I don't think that way". I said, I insisted, but when we went there and asked her, she did not believe that it was witchcraft. So Dr. Stringer was right. And she said that she did not believe that it was witchcraft. However, you could think that her family could be believing that there was witchcraft. So you see generational issues. She's the new generation, as Dr. Stringer was saying. Science - everything is due to science and they believe what science says about the disease. But her parents were still bringing that belief in her that it could be witchcraft. So that's the way we still have two generations here.

John Bellone 25:23



I see. And, like you alluded to, I'm sure that causes a lot of family issues and drama between older and younger individuals in a family, I'd imagine. Lots of stigma associated with that, too. Could either you talk about the current state of psychology and neuropsychology in sub-Saharan Africa right now? What does psychology and neuropsychology look like?

Jean Ikanga 25:51



Let me talk in terms of psychology and neuropsychology. Psychology, in many countries in Africa - let me talk this way, let me divide it mostly into English-

speaking countries and French-speaking countries. Psychology seems to be a little bit [more] developed in English-speaking countries than in French-speaking countries. And that also would even in neuropsychology. So what we will see in psychology is mostly related to the science of education. So psychology has been used mostly to how to educate rather than the aspect that I saw so much in the United States. Psychology there is the clinical aspect, and psychology is used in industry. But in Africa, psychology seems to be so much used in educating. Why? Because people, as I said, here will not think that having a mental problem is due to any issue related to the parent, any issue with cognitive distortion, they will not think that way. So that's why psychology of education is not so much developed. For example, here in the Congo, we have three universities, or four, in the whole big country which have a program of clinical psychology. That's at the master level, with very few students by the way. And these clinical psychologists who have finished generally do not have a job because the society is not ready to welcome them. In terms of neuropsychology programs, there are some - for the time being there might be some, I'm not so precise on it. Some research is being underway. But for the time being, we'll have only two programs in clinical neuropsychology. A few programs are in South Africa, at the University of Cape Town. So they have a very good master's program in clinical neuropsychology. If you look at it, it looks like one in the United States or in Europe. And another second one is in Zambia. And there is a third program that Dr. Stringer and Suzanne have started in Rwanda. So these are the three programs in neuropsychology in Africa. And, if you see, they are just in English-speaking countries, not in French-speaking countries. So this is what I can talk a little bit about psychology and neuropsychology in Africa. Dr. Stringer, I don't know if I've missed something.

Tony Stringer 28:31



Well, maybe the thing which will be most striking is that a Ph.D. is not typically required in order to practice psychology, you know, where it exists in Africa. Entry level is sometimes at the bachelor's degree and you can begin practicing clinically. A master's degree is considered to be more advanced, and the doctorate is a lot rarer. You know, you would find probably university faculty at the doctorate level, but at the practitioner level it is more likely to be bachelor's or master's degrees.

Ryan Van Patten 29:01



Yeah, I've seen that in a number of countries outside of North America and Europe, that neuropsychology can be practiced at the master's level. So maybe we are the odd people out in requiring the doctorate.

Tony Stringer 29:14



Yeah. Well, I think very much though, I believe that the trend is probably going to move towards more advanced degree requirements. I know at least my experience in working in Rwanda, that's been the desire of the faculty we've been collaborating with there. Is to move the profession more in the direction of having advanced degrees. And that's seen as an asset, both in terms of future salary, but also in terms of the acceptability of the field and the valuing of the field within the country.

John Bellone 29:42



Not to divert us too much, but, Tony, I'm interested in what you've done in Rwanda. Jean said it was with Suzanne, I'm assuming Dr. Penna?

Tony Stringer 29:51



Yeah, Suzanne Penna. I should say that Suzanne Penna is the lead on that work. I've been her collaborator. Her name definitely should be first and she should have the lion's share of the credit. But we've done an introductory course in neuropsychology in Rwanda and an associated lab course to teach test administration. We've been teaching both administration of Western tests, but then also of the African battery as well. I did probably a handful of the lectures and Dr. Penna did the vast majority. And then Jean was also extremely valuable in helping the students understand the lecture content because we were lecturing in English. The country has adopted English as its national language, but truthfully, most people are probably more comfortable in French. So, you know, having Jean there to translate what we're saying into French was also really critical.

John Bellone 30:45



Excellent. In terms of neurological and neurodegenerative diseases, I'm curious if you might talk a bit about the prevalence rates in sub-Saharan countries.

Jean Ikanga 30:58



Some few studies, I think that we read, Dr. Stringer and I, we read. For example, neurological disorders account for 7 to 24% of admissions in African hospitals. So that's one we read. Cerebrovascular disease will be 11.3%. A traumatic brain injury might be 8%. Brain tumor, I think, will be probably 3.9%, is what some literature finds. But in terms of neurodegenerative disorders, it varies, mostly Alzheimer's disease I meant to say, varies between 2.29%, this is found in Yoruba, in Nigeria, to 21.60% in the rural districts of Tanzania. So that is what was found in Africa. The prevalence of Alzheimer's disease in French-speaking countries - for example, in Benin, Republic of Congo, Central Africa - the prevalence is, among those between

[age] 65 to 74, it ranges between 2.5% to 3.9%. So this is to give you a kind of idea of neurological disorders and neurodegenerative disorders.

Tony Stringer 32:27



It's also important to consider just the rate of infectious disease in Africa as well. This is more anecdotal than anything else, but I have a physician colleague from Nigeria who became interested in going into medicine because of the number of hospitalizations he experienced growing up, you know, for malaria. I mean, I think he was on his fourth or fifth hospitalization when he decided, you know, "Doctors are good, and I think maybe I'd like to become one". But, we have to have a very different conception of what normal health is when we're dealing with African populations. Because it is normal to have been exposed to a number of different infectious conditions, and to have been hospitalized for them, that we don't encounter here in the West. And what the neurological effects of that is, truthfully, again, we don't know. It's another question that deserves to be studied.



John Bellone 33:17

Yeah.

Tony Stringer 33:18



Without derailing too much, I want to just - I feel compelled just to say one other thing, if I can, and, you know, I'm sensitive to stereotypes as well. I think, oftentimes, we stereotype Africa and the African population from very much a deficit standpoint. I think it's really important to also emphasize some of the strengths of the population. It's equally important to study resilience in Africa. It is a population that endures a lot that we don't endure here in the West, and that also conveys a number of strengths of character and personality. There's a lot of stamina in the African psyche. And I think it's very important to recognize that in approaching this population.



John Bellone 34:01

That's an excellent point. We, as neuropsychologists, are typically focused on all the bad things. [laughs]



Jean Ikanga 34:06

[laughs]

Ryan Van Patten 34:07



Yeah. Well, there are also strengths that you mentioned earlier, Tony, that are specifically cognitive or potentially - multilingualism is much more prevalent in Africa than it is in the West. And then also the oral tradition of transmitting knowledge across generations could confer a benefit in terms of verbal memory. Actually, do either of you know, have there been studies on that? Cross-cultural studies?

Tony Stringer 34:37



I'm not personally aware of any. I mostly just read more anecdotal accounts. I was just reading actually the other day - you know, this was some diary entries from, I think, over a century ago, but it was discussing the experience of a European trader trying to do deals with African trading partners. The fact of the European trader was resorting to paper and pencil calculations to price various goods, whereas the Africans were doing it all in their head and would come up with answers really quickly. And the guy was just noting what an advantage they had because they were oftentimes coming up better in these trade deals, because they were able to do these calculations so rapidly and without resorting to any external aid whatsoever. So, yeah, I don't know. Jean, do you know of any formal studies of those kinds of things? I've only heard of more anecdotal reports.

Jean Ikanga 35:34

No, I, myself, really, I have not read any article like that. But what I know is what you and I have planned. That after we finish with the norms with this battery, probably we would like to look in the battery on whether there is a difference between verbal/auditory modality and visuospatial modality. So that's what we are trying to see. But I've not yet read any article on that.



But, if you wouldn't mind, I would like just to bring up something Dr. Stringer said. I have some friends from the United States who came with me. So, I went with them to the rural area because they are helping to bring in a clinic there. One of the first things they saw in people was, they did not have much to do. I'm not exaggerating this, I'm quoting them - they were among the happiest people they have found. They were so happy, even in the church, dancing and happy. And when they saw them, they were not having a gloomy face, they were so happy. So that's something very important to notice in many people in Africa. Besides they don't have much, but they know that happiness is not in the having, happiness is a state of mind.

Ryan Van Patten 36:57



Yeah. Thanks to you both for talking about the strengths of people from Africa - the resilience, happiness, cognitive advantages, potentially, very important to highlight. We are getting close to bringing up the African Neuropsych Battery [laughs], but I wanted to ask maybe one or two more questions first. Prior to that battery being developed, there have been studies of cognitive functioning in African neurological populations. But those studies tended to use Western neuropsych tests adapted for local populations rather than measures conceived in and designed for those cultures specifically. This approach is sometimes equated with a cognitive universalist perspective - the idea that core cognitive constructs like attention, memory, and language, manifest similarly in people across different cultures. But there's a contrasting idea - the cognitive relativist perspective, which says that cognitive processes vary across different cultures. So I'm just curious about your thoughts.



Tony Stringer 38:05

Jean, would you like to start?

Jean Ikanga 38:06

I would have said that this would have been a good one for you to start. But let me just give some points, and I know Dr. Stringer can put more flesh on what I'm saying. I have been among those who do not think that we should go to this cognitive universalistic perspective. I think that the clinical presentation of cognitive neurological disease is affected by the cultural context. That is my approach. Let's just give the example of what we just said - the approach that the African is an oral tradition. So if someone has grown up in that way, the perspective of auditory/verbal memory probably is different than what it is in you or in someone in Asia.



Another thing that I would like to say is what we just said here. The concept of, for example, the concept of time. The time is a mathematical approach in the West, here it is [an] event approach. So when you give the test of [verbal] fluency, you might think that in Africa it might be the same. But for us here, there is no hurry in Africa. So you might not find the same way. The other aspect that I bring up is - and I have been one of the people thinking, if I have a lot of time to think, to search - about the executive functioning. In Africa, the concept of planning is different. The future is different. So we need to find a different way [to see if] cognitive executive function is the same in Africa than what is in Europe. So, for me, I don't have yet evidence, but I don't buy so much cognitive universalist perspective approach. I

think that the presentation of cognitive neurological disorders is specific to different cultures.

Tony Stringer 40:15



I might come at it a little bit differently than Jean. I do think that there are cognitive universals and things which are just part and parcel of having a human nervous system. But I do think that those skills are practiced to different degrees in different individuals and in different cultures. Just to use a trivial example, you know, I'm not a musician by any stretch of the imagination, and so, if you look at the way in which my brain processes music, it's going to be different from the way the brain of a musician processes music. So just our personal histories dictate some differences in the way our brains are organized, and also on the efficiency with which they handle different types of information. But I think it becomes even more prevalent when it's a culture-wide, shared difference, in terms of how practiced certain skills are. So I think both approaches are valid - you know, both the universal and the more particular approaches. I think both of them have relevance to understanding performance in any human population.

John Bellone 41:17



Yeah, they're not necessarily mutually exclusive, entirely. Yeah. What are some potential advantages to developing neuropsych tests regionally and locally, and specifically for sub-Saharan countries, as compared to using Western cognitive tests? I know this kind of gets to what we were talking about, you know, about the relativistic differences.

Jean Ikanga 41:41



I think, yeah, the answer for me is that, maybe Dr. Stringer put it nicely. I would say, are cognitive functions the same all over? Yes. Are they presented or to be assessed in the same way that is the approach? I say no. Because attention is there in Africa. Are the cultural elements to assess attention and memory the same, like in Europe? No. So that's where we come to developing tests in Africa, because the cultural approach [and] presentation of the test is different in Africa. The stimuli of the tests are - what would be the goal to talk about Anna Thompson in Africa? Because that is difficult...

Ryan Van Patten 42:30



[laughs]

Jean Ikanga 42:30



I experienced many times having difficulty in pronouncing some Western names. And it is the same for you by having difficulty in saying my name, Ikanga. So if that's such a difficulty, it becomes one more difficulty in doing a test to have a stimulus which is foreign to you. So that's the element why I think it is very important to have a test in Africa. I don't know, Dr. Stringer, you might put it better than I do.

John Bellone 43:04



I was gonna say, first, I can't even pronounce your first name, Jean, correctly. [laughs]

Tony Stringer 43:10



Well, he likes the French pronunciation. So, /Jean/. [laughs]

Ryan Van Patten 43:14



[laughs]

John Bellone 43:15



We're trying, we're trying. [laughs]

Jean Ikanga 43:17



[laughs]

Tony Stringer 43:20



You know, I guess just to add on to what Jean said, I think that, as clinicians, not just as neuropsychologists, but as clinicians, we want to pay attention to things like the degree to which anxiety impacts test performance. These are not the things we're trying to measure. These are the extraneous factors we're trying to minimize, to get a valid assessment of cognitive function. And I think, without question, if you are presented with a test where the format and the stimuli are unfamiliar, you're going to be at a disadvantage and it's going to potentially create anxiety. Versus if you're being tested in something which is culturally familiar, there's some recognition there, then that's going to promote getting, I think, a more valid response that reflects the underlying construct the test is attempting to measure. So just the whole familiarity with the format and the content I think that's just an important factor.

The other thing, though, that I will say is that when we bring a Western test to Africa, we're often bringing it into a context which reflects where neuropsychology was decades ago. I mean, right now, neuropsychology is a lot more functionally-oriented in the West. We often are not the ones who are there to try to discover a disease or to identify the part of the brain that's impaired. I mean, that's still an important part of what we do but that's often already known. A lot of what we do in the United States and European countries is that we're trying to describe adaptive function. We're trying to describe how this impaired brain is able to function in a particular environment. Well, that's hard to do when you're bringing a Western test into a completely different culture. So often we're doing screening assessments, which are intended to just detect disease presence, and that's certainly needed. But as we move beyond that very basic function and start looking at trying to characterize how a person can function as an independent adult or as a child in a school system, we need tests which are more comprehensive and more functionally-oriented. I think that's where having more of the familiar African content, that's where it becomes just really very important. And, as Jean is saying, again, if you can't remember Anna Thompson - well, that's great if you are from Boston, but if you are from Kigali, you know, you may need to remember someone with a very different sounding name than that. So it's important to assess in the context that the person is actually going to be living in.

Jean Ikanga 46:53

When I was finishing my last year of the postdoc, and Dr. Stringer, knowing that I'm going to be the first neuropsychologist in my country, and not only in my country, but in many other French-speaking countries, and knowing the impact that will have in Africa, I remember him telling me, my last year, saying, "Okay, Jean, we need to create a test for you to use in Africa." And I just wanted my clinical work, but he said, "No, you were [unintelligible]. And you will be working on this test." I remember what a resistance I was having, because it put me away from clinical work to do something which I knew that he knew was something great for my country and for Africa. And so in my last year of postdoc, I was there. And what I was doing was, we would, for example, we would like to create a domain, we were looking about, what are the commonly used objects in Africa? We went and looked at it. So I go to him, we started saying, what are they common? And from there, we choose, what are the items? And that's the way it started. And one way to create the memory test, we had to look, what are the common categories in terms of lists? What are the, in terms of the story, we're looking [at] what are the cultural elements in the story, which can be in Africa? So in terms of executive function, we're looking [at] what are the games are people in real life are in Africa? So this is the way Dr. Stringer and I were doing it. So it was really to use this culturally and linguistically



appropriate element in order to create a test. Dr. Stringer? I don't know if I missed something.

Tony Stringer 48:57



Yeah, I mean, the framework was to begin with sort of the classic neuropsychological domains that we measure - so looking at attention, memory, problem solving, and so on - but then to select culturally appropriate content and tasks whenever that was possible. And so that's why this is a really good collaboration. I mean, you know, I perhaps brought the knowledge of Western neuropsychology and the way we understand cognitive function, and Jean brought the cultural and linguistically-specific knowledge as well. We created the battery in English initially and then translated to French, and then did a back translation as well to make sure that we had accurate translations. English and French are the colonial languages, but with them we've covered a good part of sub-Saharan Africa and in terms of the bilingual population. We then went on to do translations in additional languages. Jean, I'll let you describe the other languages that we have translations into.

Jean Ikanga 49:53



Yeah, so here in the Congo, we've started translation into Swahili, and we've started translation into Lingala, Kikongo, and Tshiluba. And, as Dr. Stringer mentioned, since the program started in Rwanda, we need already a translation in Kinyarwanda. So these are the languages we have translated. The test has been orally translated. Now we are working to see if we can do some translation in Cameroon. And there is someone from Togo - this, Dr. Stringer, in fact, I'm bringing to you - they are asking me if we can think about translating this in Ewe which is used in Togo, Côte d'Ivoire, and Ghana.

Tony Stringer 50:41



I will say that as we are going into other countries, we're not just doing translations, we're also having to change the content. We discovered very quickly that some of the stimuli that we used in the naming test in Congo, doesn't work in Rwanda. And so we're going to have to have a different version of the test. And that's going to be true for other places as well. It's a work in progress. There's still major domains that we don't have assessments for. Perhaps the most glaring one is attention and processing speed - that's a total area that we just have not progressed on a lot, although we do now have an attention test that I think is promising. And, Jean is hopefully collecting some additional data on that as well. So it's a work in progress to be sure.



John Bellone 51:29

Yeah, but quite a lot of work, and quite versatile, it sounds like this battery is continuing to be. I'm just curious where you get the funding for these translations. I mean, most of our other batteries are only in, you know, English and if we're lucky, Spanish. That seems like a very large feat to accomplish. How are you able to translate into so many different languages and cultures?



Tony Stringer 51:52

Well, having a Catholic priest is a real advantage in terms of asking people to do your favors.



Jean Ikanga 51:57

[laughs]



Tony Stringer 51:59

Jean is very persuasive.



Ryan Van Patten 52:00

[laughs]



Jean Ikanga 52:01

Yes, I will say, Dr. Stringer is very right. I think that, I'm sorry to bring my Catholic priest card here but, you know, the Catholic Church worked in translating the Bible in many languages. So I happen to be in a place where my religious order does a lot of translation of the Bible in many languages. So it was easier for me to have the team which translates the Bible in different languages, just for them to do the translations. And after them doing the translations, I also ask some physicians who know the technical words to read whether that was what the original text in English was. So that's what Dr. Stringer said that I brought to many translations.



John Bellone 52:53

That's excellent.



Tony Stringer 52:54

But I would be remiss if I didn't also say, you know, we had very generous support from Emory University. They provided us with \$100,000 in seed funds to get this research started. Jean subsequently has had a good bit of success in terms of getting additional outside funding. He has a grant now from the Alzheimer's

Association, which is funding additional test development as well as looking at the battery and its ability to detect Alzheimer's disease and mild cognitive impairment. He's getting some additional funding now from NIH. We're going back to Emory for the C-Grant to hopefully fund more research in Rwanda as well. But, yeah, I think a lot of it is asking favors and then generous support of local institutions.



John Bellone 53:38

It sounds like if there's anyone from Pearson or PAR or other test development companies listening to this, you need to get friendly with Catholic priests.



Tony Stringer 53:45

[laughs]



John Bellone 53:47

Can you just tell us about the age range of the battery? How long it takes to administer the full battery? Can the individual tests be split up? Just the kind of nuts and bolts?



Jean Ikanga 53:59

So, in terms of the age range, we collected norms for both of these batteries, [they were] mostly built and were validated for those who are 18 years and older. So this is what we did. And the second part of the question?



John Bellone 54:21

Oh, how long does it take to administer the battery?



Jean Ikanga 54:25

Generally it will take between 2 to 3 hours.



John Bellone 54:30

Okay. Can the items be split up if someone wanted to just administer the memory tests, for example? There's that flexibility?



Jean Ikanga 54:38

I will say, yes, some can be split up. For example, I will say for Alzheimer's disease, we are just using the non-contextual memory tests. Yeah.



John Bellone 54:53

And can you also just tell us about the importance of reducing cost and reliance on technology? I know that's something that you were mindful of in developing the battery, right?



Jean Ikanga 55:03

Yes. So one of the things that Dr. Stringer and I we thought was - that we find out - is that, in Africa, many areas don't have electricity. So it is so difficult to use the computer or to use high tech. So what we did was really to create a test battery, which would be using low technology. So you can go in a rural area without a computer and start administering the test. So that was [something] we were very conscious of.



Tony Stringer 55:42

And just to amplify the response to your earlier question, the norms are by age decade and we have roughly 45 subjects per age decade up to 70+, adult aged decades in Congo specifically. And we're hoping to get something like that in Rwanda over the next year or so.



Ryan Van Patten 56:03

Great, so let's move into the tests themselves. Just for our listeners, I will run through and list the nine African Neuropsych Battery tests that I'm aware of and then we can talk about them. So there's a Neurological Screening Test, the African naming and recognition test, the African story memory test, the African contextual visuospatial Memory test, African list memory test, a visuospatial memory test, proverb test, facial perception test, and card game test. Maybe we can start with the four memory tests. If you could just briefly describe them, the stimuli, what you're looking to measure, what they look like.



Jean Ikanga 56:50

Before talking about the African list memory test, let me talk about the memory tests in general. So, what Dr. Stringer and I did was we have four measures of memory. In each modality, we have what we will call contextual and non-contextual. And each modality we will have three trials. In every trial, we will have, after the third trial, we will have a kind of a part B - if it will be list, we will be having list B. And we will have a kind of a shorter recall. And after shorter recall, we will have what all of us will know, a long delayed recall, and we will have recognition and also the forced choice. So we built all the memory tests in almost the same way.

And now, going one by one, the African list memory test, we were searching in terms of the categories which are very common in Africa. So the categories we found were body parts, that was common. The category of animals, the category of means of transportation, and the category of food. So we find these four categories. And in these four categories, we add three words by each category. And, now Dr. Stringer and I, after the studies, we have changed and it will be probably 15 [words], if I'm not mistaken. So we will be having 15 words. Now it is 12 but it will probably be changing - not probably, we have changed to 15. We are going to collect new norms. So that's what we did with the list memory test.

In terms of the story, I'm going to read the story, and you will hear all the elements.



Tony Stringer 57:06

Well, Jean, you may not want to read the story because we do want to keep the content of the tests secure.



Jean Ikanga 59:02

Okay. Thank you. Thank you for reminding me of that Dr. Stringer. So what [do] we have in the story? We have all the cultural elements. Many of the cultural elements which I've talked [about]. The first one is that the names which are used are typically African. So that's one thing. The second is the importance of the elders and the tradition. If you hear the story, you will hear the emphasis of this. The African respect of tradition and the elders. The other element which is there is the African, I will say, traditional legal way. You will hear that in that story. The other element, very important, is the sacrificial aspect in the African cultures, which is there. And the last aspect in the story is the question you asked and the answer of Dr. Stringer. So you will see that, in the story, there is this generational conflict, the conflict between the young generation and the old generation. So you will hear that in the story, which seems to [be] very typical of Africa. I don't know if, Dr. Stringer, if you want to add something before I go on.



Tony Stringer 1:00:25

No, I think that's a good summary.



Jean Ikanga 1:00:27

Yeah. So in terms of the African visuospatial memory test, we used elements coming from Adinkra, which is in Ghana, but also in Ivory Coast. But these elements are so much used in many of the African countries, sub-Saharan African countries.



Tony Stringer 1:00:49

Jean, let me just clarify. Because I think your pronunciation is a little bit different from what people in the West are used to hearing. It's Adinkra.



Jean Ikanga 1:00:54

Oh, thank you.



Tony Stringer 1:00:55

Adinkra.



Jean Ikanga 1:00:58

Thank you. So we use these symbols from the culture, which are typically very sub-Saharan. In terms of the African contextual visuospatial memory test, what we used were our stimuli [were] typically African - so we're using places and we're using animals or objects which are very African, so that you can associate in terms of learning. So this is the way we build the African memory tests. I don't know, Dr. Stringer, if you would like to add some few things.



Tony Stringer 1:01:39

No, I think you've done a nice summary job.



Jean Ikanga 1:01:42

Okay.



John Bellone 1:01:43

In terms of the list memory, my understanding is that the individual words are read at a rate of one every five seconds, which would be considerably slower than the rates for North American tests. Were there any cultural considerations that went into that, if I'm accurate?



Jean Ikanga 1:02:01

I think yes. Because, if you remember, the concept of time here is not so much hurry, and our field was - the putting in one second or two second, that will be a problem in Africa. So that's why we took that five second as something that's going to be very beneficial in terms of the culture, where time in memorizing things. Because, you see, in the United States, you have to be faster in getting things done and memorizing them. Here, it is not the same thing.

Ryan Van Patten 1:02:50



I took a look at the stimuli for the visuospatial memory test, and I was comparing them, in my mind, to similar tests we have in the U.S. or North Atlantic countries - BVMT-R, things like that. And, I imagine some people might wonder, our visuospatial memory tests use what we might think of as abstract symbols that are seen and then drawn later by the examinee, and the stimuli from the African visuospatial memory test also looked to be abstract. But I'm wondering if there's some cultural loading to those stimuli that led you to redesign the test as opposed to using WMS Visual Reproduction or BVMT or a test like that?

Jean Ikanga 1:03:36



Dr. Stringer can correct me, but one of the elements, if you look at the stimuli, you will see that those stimuli contain something very African we said - the aspect of a "we", the aspect of to be not always alone. So if you look at the stimuli it is not - the figure is not only alone. Like in the United States the stimuli will be alone, but if you will see there is that "we" aspect in every figure, so this is typical Africa. I was about to give more detail but I'm afraid to describe it more. I don't know if Dr. Stringer would allow me to.

Ryan Van Patten 1:04:19



That's a great point. [laughs]

Tony Stringer 1:04:19



I don't want to be your supervisor now, Jean. [laughs]

Jean Ikanga 1:04:22



Yes. You know, I forgot that. [laughs]

Tony Stringer 1:04:25



What I will say is, the truth of the matter is that visuospatial memory is hard to measure. And people who work with epilepsy surgery populations here in the West even know this. It's really hard to develop a measure that is sensitive to right temporal lobe seizure foci because we automatically translate visuospatial memory tests into verbal memory tests - we label the stimuli and then remember them verbally. I know I do that, and I think that's very common for lots and lots of people. The issue with using Western tests, which have triangles and rectangles and other verbalizable symbols like that, is that those shapes may not have the same meaning. And so partly what I wanted to do was to create a test that would be,

hopefully still visuospatial in nature, hopefully still sensitive to more visuospatial elements, but that also would lend themselves to the same kind of labeling we do with geometric shapes here in the West. And so, you know, these symbols represent things - the symbols all have meanings associated with them. You know, the Adinkra symbols come out of Ghana; the shapes, the format are also familiar from fabric patterns and sculpture designs in a number of countries. And so for that reason there's a familiarity element there which I think makes these a little bit more compatible with a culture than some of the Western tests that we would use. And Jean had a pretty strenuous objection to using the kinds of geometric shapes that we learn to draw here in the West in elementary school. You said that's not a part of African education and I listened to that. And so we went with something that might be a little bit more familiar to the population there.

Ryan Van Patten 1:06:11



Yeah, these are great answers, and I think very helpful and enlightening to people listening from the West. We might be tempted to think that, "Oh, geometric shapes are the same everywhere, and so these tests are culture-free." But that's not the case and so I just wanted to bring that to light.

John Bellone 1:06:28



Can you give us some specifics about the non-memory tests? You know, the neurological screening tests, the naming and recognition tests, proverbs, facial perception, card game tests? Again, without risking test security, of course. [laughs]

Tony Stringer 1:06:43



Yeah, well, I'll jump in real quick, with just the screening measure and I'll let Jean respond to the rest. So the screening measure is probably the area where we really didn't do a lot of translation. You know, this is just basic - assessment of visual fields in response to unilateral and bilateral simultaneous stimulation. Basic motor coordination tasks. But, again, we didn't want to have the expense of a grooved pegboard, so we went with a coin stacking task. So we're timing how quickly they can stack the smallest denomination coin from the local currency. And then we have a reaching task. So just basic neurological measures to pick up sensory deficits or very basic motor deficits. That part we think is probably independent of culture.



John Bellone 1:07:27

Okay.



Tony Stringer 1:07:28

Jean, I'll let you go ahead and continue with the more culture-specific tests.



Jean Ikanga 1:07:33

So let me talk about the African proverb interpretation test. This is a test that we created for mental abstraction. And this test we - as I said from the beginning, the African culture, very young we are told about proverbs. And even when you go [to an] elder, when he speaks, he starts with a proverb and ends with a proverb. When the elders speak with a proverb, you know are you right or you are wrong. So the proverb is very important in Africa for mental abstraction. So that's why, while creating the test for mental abstraction, Dr. Stringer and I used proverbs from different parts of Africa. So we use different proverbs [that] were coming from Congo, from South Africa, from Liberia, from Kenya. So this is the way we did it.



Tony Stringer 1:08:36

I'll say, just to add, the scoring will be familiar to people who have scored a Wechsler scale. You know, you get 2 points for an abstract response, 1 point for a less abstract response, and then 0 points for very concrete literal interpretation.



Jean Ikanga 1:08:52

Yeah, thank you for that, Dr. Stringer. So another test that we created for executive functioning was the African card game test. So the African card game test is - we use the cards, which are very much played in Africa. And we use the way of some tests which are played where there is an elder which knows what is in mind and the younger one has to find out what the elder is thinking. So as a way [of] problem solving. So this is the way Dr. Stringer and I created these tests of problem solving. In fact, it is one of the tests - one day someone here in the Congo was giving the test, I'll never forget, after we were collecting the data, he came out of it and he said, "Wow, you guys are very genius in creating that test." So it is one of the tests I see of really using, like others, but this one is using a lot of cultural elements. Dr. Stringer, you know, I'm so cautious now to give so much detail.



Ryan Van Patten 1:10:07

[laughs]



Tony Stringer 1:10:10

It will remind people of the Wisconsin Card Sorting Test in a sense. But it just uses an ordinary deck of playing cards. And the thing which was a surprise to me was

that this was actually a game that is played very commonly in Africa where there isn't any set rule for how you win. But, basically, the dealer gets to decide what the winning strategy is. So it could be like the low card wins, or it could be the high card wins, or it could be a card of a particular suit that wins - and the task is to figure it out. And, I actually liken it more to Dungeons & Dragons, you know, where the dungeon master makes up a lot of the rules and you have to figure out how to win based on that.



John Bellone 1:10:49

Fascinating. Can you summarize the current evidence supporting psychometrics and clinical utility of the battery?



Tony Stringer 1:10:58

Well...Go ahead, Jean, I'll let you answer.



Jean Ikanga 1:11:00

No, Dr. Stringer, I think that you can go.



Tony Stringer 1:11:03

Okay. All right. Well, so, we are still at the beginning in terms of this. Jean has a paper now under review where he's the lead author looking at the reliability of the test battery. What I will say briefly is that we compared the reliability of the battery and we looked at different types of reliability. We looked at inter-rater reliability for the test that involves some subjective judgment, like the proverb interpretation, for example. We looked at internal consistency for tests, which we think all of the parts of the test should be intercorrelated well. So we've been able to show that the reliability is comparable to similar Western tests. So looking at the card sorting game that Jean was just describing, its reliability is comparable to the reliability data available for the Wisconsin Card Sort or the category test. And, similarly, the memory tests have similar reliability. There in particular, we're looking at test-retest reliability. The nice thing is that we looked at test-retest reliability over a period of a year, which is more comparable to what a neuropsychologist would do. You know, most of the tests that are in our test batteries here in the United States, the test-retest reliability interval is a matter of weeks, sometimes it's even just days. So we're showing really comparable reliability as Western tests but over a period of a full year, and I think that's a pretty good accomplishment. Surprisingly, the motor tests have the least strong reliability data for them. And I think those are going to go through some evolution. Here, it may very well be what Jean is describing, and that is that it is hard to motivate people to perform consistently and rapidly. So we may

need to add more trials to get more of an average performance in order to get more reliable scoring on those measures. The validity data, right now, that data is limited to comparing a stroke sample with an age-, education-, and gender-matched normative sample. So, it's roughly 50 stroke patients and 50 matched controls. And we've able to show high sensitivity and specificity to stroke with the battery as it currently exists. The study Jean is now doing is looking at a subset of the tests as a screening device for detecting Alzheimer's disease. And, Jean, as we've already said, he's the first neuropsychologist in Congo. He's also now doing the first study of Alzheimer's disease in Congo as well. You know, so a number of firsts here.

Ryan Van Patten 1:13:37



Yeah, that's great work. Very important. I wanted to highlight a few other findings that I've read about with respect to the ANB. I believe that some of your data show that men tend to outperform women, and that people from urban environments tend to outperform those from rural environments. I'm wondering if you could expand on that and potentially talk about if there are educational differences that explain these group differences.



Tony Stringer 1:14:04

Yeah, well...I'm sorry. Go ahead, Jean, I'll let you answer.

Jean Ikanga 1:14:07



Yeah. So when we look at the relationship of age in ANB, as Dr. Stringer was saying, we have the test [and] we did it using normative decades. So we have the 60 to 70, and those who are 18 to 29. Not going too much in detail. So what we find out was that all ANB tests show significant differences across age decades. Those in the younger age were associated with better performance. And that's also when we're looking with the Bonferroni post hoc comparison. We saw that there was quite a difference. So in terms of age, younger [people] were performing better than older. So we went also to look in terms of education and we find also that all ANB tests show significant differences across the educational level. So more years of education was associated with better performance. And that also with the Bonferroni post hoc comparisons when we did it. In terms of gender, we find out that men tend to perform better in some tests than females. And in terms of the place where people were living, we find that those in the cities tend to perform a little bit better in some tests, not in all of them, than those who were living in a rural area. So that's why, in creating the norms, Dr. Stringer and I started putting some norms in terms of age, years of education, and gender.

Tony Stringer 1:15:55

And maybe just to amplify some of that. Age, education, gender - they're all very much intercorrelated in the sample that we have. Just a concrete example. I mean, if you're female living in a rural environment, that means you're going to have access to less education and less quality of education. And so how do you disentangle gender from education in a rural environment? It's really impossible. And, you know, we tend to pretend these statistical techniques are sort of a magical window, but they're not. When variables truly are so closely connected in the real world, you have to have almost infinitely large sample sizes to truly get enough variability to begin to disentangle all of those things in a really reliable way. So these are very intercorrelated. I don't think that African women perform more poorly than do African men. I think it's such a complex mix of factors that it's really hard to make a definitive statement. Even with a sample size, which I think is reasonable that we have, we need many orders of magnitude larger sample sizes in order to really disentangle all these variables.



John Bellone 1:17:11

Yeah. I'm glad you mentioned that.

Ryan Van Patten 1:17:12

Is the difference in men versus women is that - I thought that might be a pretty straightforward case where it's just that men tend to have higher education than women and so that was likely the explanatory factor. But it's more complicated than that.



Tony Stringer 1:17:29

Yeah, I think so. If you do look at the multiple regression equations, education consistently emerges as the main predictor explaining most of the variance. But you still get variance accounted for when you add additional variables onto it, and so there's some independent variability there. But, again, I'm going to attribute that more to the limits of the sample size. It's not allowing us to make fine enough distinctions between individuals.



Ryan Van Patten 1:17:57

Right.



John Bellone 1:17:58

Yeah, good point. Given that there are very few neuropsychologists in sub-Saharan Africa, who do you envision will administer the ANB in Africa?



Jean Ikanga 1:18:09

So, for example, here in the Congo, what I did was I trained some of those who are in clinical psychology. Because I thought they will have some knowledge and some training in psychometrics and assessment. So that's what I did. But, interestingly, Dr. Stringer will say that you will not find it in the United States, some psychiatrists and neurologists were very much interested in knowing more about the test. So some were involved. But to answer your question, those, I think, will be the ones to give the test are those mostly in clinical psychology I think.



John Bellone 1:18:55

Makes sense. Will the ANB be made available to practitioners in the U.S. who test people from sub-Saharan Africa? Were those the people who you alluded to in the U.S. that might be interested?



Tony Stringer 1:19:09

Yeah, I very much hope so. You know, we don't have a test publisher. We certainly have talked to test publishers, but no one is particularly interested. Well, first of all, I mean, the Western test publishers don't sell tests in Africa, so that's just not part of their market. And here, in the United States, the number of people that would be interested in purchasing the battery is going to be pretty small. So it's not worth the investment for most test publishers. So, I think our intent is going to be to make this battery available probably for download in some format or another, but basically just kind of at cost more than anything else. Yeah. I don't think we're anticipating anything beyond that. But, looking farther ahead, Africa needs a test publisher. Our battery is not the only battery of tests that have arisen out of African culture, there are other tests. If you've read the literature, there may be just one study that's been done on a particular test, but there are other tests that have been developed in different countries in Africa. I do think all of those tests do need to be collected and made available by someone as psychology and neuropsychology continues to advance in Africa. And that may be a very different model than we have here. It may not be a for-profit model. It may be that an African organization takes on the task of collating and making available those tests to practitioners. But Africa does need some model for test accumulation and distribution.



John Bellone 1:20:40

Yeah, well, in addition to, you know, Catholic priest, neuropsychologist, and test designer, I'm sure Jean can take on test publisher as well. [laughs]



Ryan Van Patten 1:20:47

[laughs]



Tony Stinger 1:20:49

Don't give him too many ideas, he'll do it. [laughs]



John Bellone 1:20:54

So it's not available now is what I'm gathering. Do you know when it would be available?



Tony Stringer 1:21:00

You can email us and I'm sure one of us would be happy to send it out. And we've done that, we've sent it to other people who've requested it. I wouldn't want to get a ton of emails, I just don't have the time to deal with that. [laughs] But certainly, yeah, certainly we will try to find some mechanism where it can be a little bit more automatic and not depend upon one of us finding time to send materials out.



John Bellone 1:21:20

Right. I'm wondering how - Is there anything from our listeners that, you know, if anyone wanted to contribute or anything you would ask? Any way they could help?



Tony Stringer 1:21:30

Jean, that's your area, you go ahead and answer that. [laughs]



Jean Ikanga 1:21:33

No, in terms of help, I don't know. My point is what Dr. Stringer said, we need really to - since Africa has many languages and many countries, we need some psychologists who can take the test. I'll just give an example. If you would like to take this test and do some research and take some norms, I'll just give an example, in Senegal, and do some research with that. I think that's a way we can have norms in Senegal, and we can have norms in different countries. Another help that I really need is - Dr. Stringer and I started, [but] we need people who can help us make it better and improve it. One of the questions Dr. Stringer and I are working on is how to assess languages in patients in Africa. And the aspect we have now is Africans

speaking many languages. Which language do we need to do the assessment of a stroke patient, for example? So these are things that we need. Those are some ways to work or collaborate in these aspects for those who have expertise. Surely, not only that, but to have these tests and start working with different diseases. One of the interests Dr. Stringer and I have is in terms of stroke, in terms of trying to see people's cognitive resilience in many people and other pathologies. So, this is where we need to find and surely to have this test improved and published.

Tony Stringer 1:23:22

Yeah, so I think Jean will be very interested in collaborating with people, for sure, who have interesting applications. I'm very interested in refugee populations from Africa here in the United States. We have growing refugee communities in a number of major urban areas. The African refugee population is one of the fastest growing, if not the fastest growing, and it's often a pretty well-educated population. So it's a population for which Congo assessments can be really important, you know, if they are in occupations that put them at risk for traumatic brain injury. Or if they're simply refugees from conflict, and need to be able to establish their refugee status. I mean, something which is very striking is that these are, in many respects, forensic cases and so they have to prove that they were victims of torture, victims of abuse. Well, if you think about that, though, it's a challenge both from the standpoint of our tendency to try to forget the really painful things that have happened to us. So many of these individuals have posttraumatic stress disorder which makes it hard for them to remember. But also, if they were subjected to beatings, they may have traumatic brain injuries as well. Well, how do you demonstrate that in a refugee population that may not speak English and that certainly doesn't have tests here which were normed for them? And perhaps a battery like the African Battery is one tool in being able to address the needs of this growing population here in the United States. I believe that Jean also accepts donations for his work as well. I don't think Jean has a nonprofit, although we do take donations through Emory University. But Jean, also, I think he accepts some donations for some of the work that he does in Congo as well.



John Bellone 1:25:12

Excellent. Yeah. Tony, we were gonna ask you about your work with African refugees, if we had time at the end. So you already...



Tony Stringer 1:25:19

Oh, sorry. I jumped ahead. [laughs]





John Bellone 1:25:22

[laughs]



Tony Stringer 1:25:22

I thought we were at the end, that's why. [laughs]



Ryan Van Patten 1:25:26

We just have about three more hours to go. [laughs]



Tony Stringer 1:25:28

Oh, great. Okay. [laughs]

Ryan Van Patten 1:25:29



I'm only kidding. We're almost there. [laughs] I did want to ask if either of you have advice for other clinicians and researchers who are themselves interested in developing culturally-appropriate batteries? From people, from countries all over the world, in Africa or elsewhere, but countries who are underrepresented in neuropsychology?

Jean Ikanga 1:25:52



My advice is what Dr. Stringer told me as a neuropsychologist is: Know the brain. Know when there is something going wrong with that part of the brain, what could be the issues. So that's the first thing you know. And the other thing that I learned from him is, now, how to assess what is there? And it is there that you start saying, "If this is the problem, what are the cultural elements that are needed to assess what I see as a problem?" I think that those who started neuropsychology were doing like that. So they know what's going on wrong with the brain. And, at that time, they say, "How can I assess this? And how can I assess this using cultural elements?" So this is what is present so that it is not the culture - the deficit, we might be saying it is deficit, but it might be something cultural. That's why what Dr. Stringer and I need was to find out what is cultural so that we can find the impact of the deficit related to the brain, rather than what is related to education, what is related to lack of good culture - telling them about the president of France that they don't know. So my advice is that - know the brain and know the culture.



Tony Stringer 1:27:24

I guess the advice I would give, I want to quote Ted Judd, who's a hero of mine. I don't know if you've done an interview with him. But if you haven't, you really should...



John Bellone 1:27:33

It was our last episode. We just released it a couple days ago.



Tony Stringer 1:27:36

Oh, awesome. Well, everyone should listen to that. [laughs] This thing doesn't originate with Ted, but he says it a lot and so I like to associate it with him. And what he often says about work in different cultural contexts is "Nothing about me, without me." And I think that is a wonderful guiding principle. You know, I think whatever accomplishment Jean and I have achieved or will achieve through this, it comes to the collaboration. This is not something that I could have taken on without Jean. So from my standpoint, in some ways, it's just serendipity that I had this...



Jean Ikanga 1:28:13

Neither would I without you.



Tony Stringer 1:28:14

Well, thank you. Yeah, it's just something. It's serendipity that I had this very aggressive student who came chasing after me from Congo and dragged me into this area.



Ryan Van Patten 1:28:25

[laughs]



Tony Stringer 1:28:25

But, you know, I could not have done it without Jean and I'm happy that I've been able to contribute some to Jean as well. But Jean will carry on this work. I think this is his, you know, this is his future career direction. And I think he'll do great things with it. But, yeah, I think the key is kind of the collaboration, you know, the cross-cultural collaboration between perhaps Western scientists and beginning scientists in developing countries, you know, beginning and established scientists in developing countries. It certainly brought lots of fascinating issues to my mind to ponder, and so I'm immensely grateful for Jean having chased me down at that conference some years ago.



Ryan Van Patten 1:29:02

[laughs]

John Bellone 1:29:03

All right, well, this has been so interesting. And we have just a couple bonus questions for you, Jean, before we let both of you go. Tony was already in the hot seat so he doesn't have to answer these. Unless, Tony, if there's anything you wanted to add, you get a second chance at the bonus questions. But Jean, these are mainly for you. So if you could improve one thing about the field of neuropsychology, and it doesn't have to be related to African neuropsychology, but in general, what's one thing you would you would improve about the field?



Jean Ikanga 1:29:33

You know, that's a very good question, if I have to improve the field of neuropsychology. My point is, really, what I just said, is to really pay attention to the culture. That is something that I find very interesting for the time being. Because if we miss that, we think that everyone is the same, we miss the diversity. That's how Dr. Stringer has said, we will miss the clinical aspect that, as a clinician, we should be having. That's one thing that I will say. You say one thing? Yes.



Ryan Van Patten 1:30:18

Great. Jean, what is one bit of advice you wish someone told you when you were training, or maybe someone did tell you that really made a difference? So here we're asking for an actionable step that trainees who are listening could take that they may not have thought of that can improve their training and performance in neuropsychology.



Jean Ikanga 1:30:39

You know, I wish, because I knew I was coming to Africa, I wish, during my training, I had someone who told me, "Africa is an oral tradition, and think of neuropsychology differently." Because now I am in Africa, I'm starting to rethink neuropsychology differently. How to do assessment? How to do feedback? How to write a neuropsychological report? My first shock - I remember writing the way Dr. Stringer taught me [to write] the report, and I gave it to a patient and the patient looked at me and said, "Oh, Doctor, were you trained in the United States or in Europe?" Because he was not expecting me to give him a 4 or 5 page report, which he is not going probably to read. So I wish that someone told me, in my training, that going to Africa it will be different. Or going to the rest of the world, it will be



different. And Dr. Stringer told me at the end, by creating the test, that I did not know.



Ryan Van Patten 1:31:54

Great.

Tony Stringer 1:31:55



Well, if I could add something to that. One thing that I would change, and I would say this specifically about African neuropsychology and I would say it about African neuropsychology as practiced by Jean Ikanga - the one thing that I would change is I would try to get Jean Ikanga to call me by my first name.



John Bellone 1:32:16

[laughs]



Tony Stringer 1:32:16

He has never been able to do that. The word “Tony” does not seem to be able to form on his lips. [laughs]



Ryan Van Patten 1:32:22

[laughs]



John Bellone 1:32:23

That's funny.



Tony Stringer 1:32:24

That's the one I'd change.



Jean Ikanga 1:32:26

It's the respect of elders, Dr. Stringer. It is against my tradition. We respect the elders and you are the embodiment of my elders in neuropsychology. I will not call you by your first name.



Tony Stringer 1:32:41

Okay, I give up. [laughs]



Ryan Van Patten 1:32:43

You tried. [laughs]



John Bellone 1:32:44

[laughs]

Ryan Van Patten 1:32:46



Well, this has been wonderful and fascinating. This work is so very important. We need a lot more of this in neuropsychology. So thanks to you both. We're deeply grateful for your time and energy and speaking with us today.



Tony Stringer 1:33:01

Thank you. I very much enjoyed it.



Jean Ikanga 1:33:02

Thank you for inviting us.



Transition Music 1:33:04

Ryan Van Patten 1:33:08



Well, that does it for our conversation with Jean and Tony. Be on the lookout for upcoming episodes on cognitive reserve, behavioral variant FTD, clinical case presentations, and much more. And, as always, thanks so much for listening, and join us next time as we continue to navigate the brain and behavior.



Exit Music 1:33:28

John Bellone 1:33:51



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Ryan Van Patten 1:34:03

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