A BLANK SLATE

Brain science and Culture Conference

Florence, April 4-6, 2019

Opening Session April 4, 2019

Fondazione Intercultura onlus

Citation APA: Nguyen-Phuong-Mai, M. (2019, April). *There is No Blank Slate: The Role of Geography, Genes, Brain and Behavior in Shaping Culture*. Keynote given at the conference "A Blank Slate: Brain Science and Culture", April 4-6, 2019, Florence.

Abstract

The field of intercultural studies has been strongly dominated by a static paradigm of culture. We learn the values, and nurture shapes who we are. A famous analogy "culture is the software of the mind" illustrates this assumption. This metaphor reinforces the idea of blank slate – a fundamental bedrock of behaviorism. It also implies that individuals are born ready to be "installed" with a cultural software.

Taking an interdisciplinary approach, we will explore the notion that culture has a dynamic relationship with biology. Discussing culture without discussing the link with biology may oversimplify the evolutionary role of culture. This relationship manifests itself in the way culture has evolved to be a survival strategy for human beings. Culture is not a "superorganic" as Durkeheim – the founder of sociology – assumed. It does not float in its own universe, waiting to impose its power on human beings.

In sum, culture is not only (1) socially learned, but also (2) geographically influenced; (3) genetically inherited; and (4) neurally enabled. This presentation explores these ideas, and discusses the potential of new directions in theories and practices as a result of this new way of looking at culture.

Bio

Dr. Mai Nguyen-Phuong-Mai (or Mai Nguyen) is Associate Professor at Amsterdam School of International Business (AMSIB). Her research interests include Cross-cultural management, Diversity/Bias Management, and Change Management. She owns a training agency and is a frequent keynote speaker for conferences and corporates.

In the last few years, she has taken interest in brain science together with her study in Neuroscience at King's College London. In May 2017, she published a book with the title: *Intercultural Communication – An Interdisciplinary Approach: When Neurons, Genes, and Evolution Joined the Discourse.* This is the first text book in the field of Intercultural Communication (IC) that incorporates some insight from newly emerging disciplines. It questions the theories of Hofstede and the like, advocating for a shifting paradigm, from seeing culture as static to seeing culture dynamic. The speech in this conference is largely taken from the book's first chapter.

Her up-and-coming book with Routledge is due in August 2019, which is also another effort to review and enrich the field of cross-cultural management/ communication with insight from neuroscience.

Contact

Dr. Mai Nguyen-Phuong-Mai
Amsterdam School of International Business | Amsterdam University of Applied Science
CultureMove@CultureMove.com
facebook.com/dr.nguyenphuongmai

Keynote Text

Good afternoon everyone. It is a great honour to stand here in the magnificent Palazzo Vecchio and to contribute to this unique conference. My guess is that I was invited because of this book that I published more than a year ago: *Intercultural Communication – An Interdisciplinary Approach: When Genes, Neurons, and Evolution Join the Discourse*.

It is a textbook in intercultural communication. What makes it stand apart is probably the incorporation of some very basic insight from neuroscience. I dedicated a chapter on how our cultural diversity is shaped by many factors, from geography, genes, to the role of the brain and behaviours. What I'm going to share with you today mostly comes from this chapter.

But first, because this conference is very interdisciplinary, since I am an interculturalist, I would like to have a show of hands to see who are in the same field with me? For those who raised your hands, I hope you can relate with my story.

25 years ago when I started my undergraduate studies, nobody told me that most of the teachers, theories, and practices that I learned from belong to one side of a very famous debate in psychology: cognitive and behavioural psychology. Put it in a very simple way, cognitive psychology is concerned about what happens in our mind. But behavioural psychology is concerned about our consequential behaviours. For a strict behaviourist, the brain is a black box. If you can't see it, you can't study it scientifically. This is rooted in an ancient debate between nature or nurture. The result of this debate has created a great divide in our archive of knowledge.

Most of my studies were influenced by theorists coming from the behavioural branch. One of them is a familiar name to many of us: Hofstede. He has a famous analogy: Culture is the software of the mind. The underlying idea is humans are born as a blank slate, like a computer with no software, ready to be installed with a cultural program, by means of values and behaviours. Biology has no business in here. BUT, is that so?

My journey of new knowledge started when I read a book written by Mark Pagel – an excellent evolutionary biologist – who is also here with us. Mark, your book marked a critical point in my academic career. Because it forced me to question the theories that I have long been a follower. These theories are not incorrect, they are, as most theories, incomplete. My new standpoint is that culture is not only socially learned, but also neutrally enabled, geographically influenced, and genetically inherited.

In this keynote, I will share with you a model I developed as an attempt to visualize this complex mechanism. The model is titled *The Diagram of Diversity Pathways.* We will now construct it step by step.

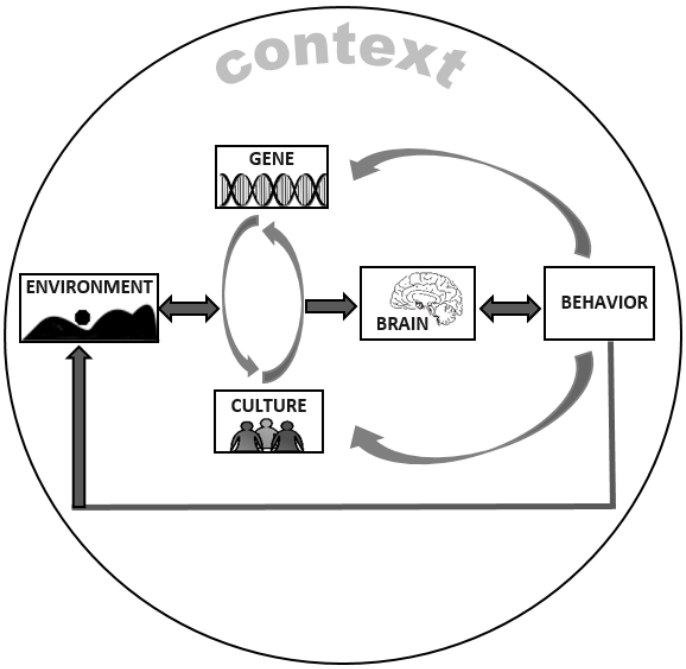
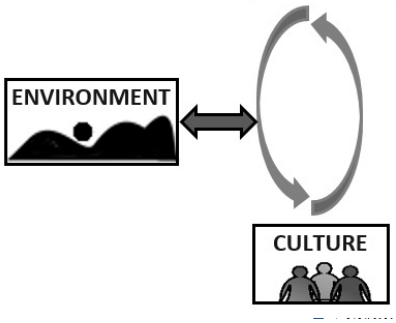


Figure 1- The Diagram of Diversity Pathways (Nguyen-Phuong-Mai, 2017: 34)

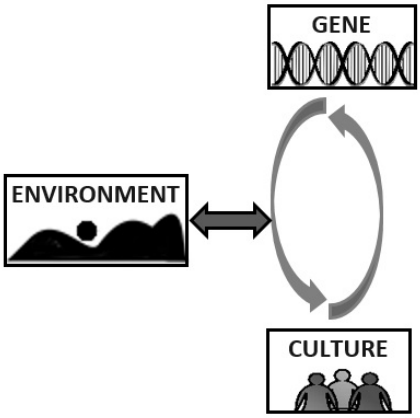
1. **Culture is geographically Influenced**



First of all, culture is geographically influenced. Many of you are already familiar with this hypothesis so I will just quickly show here three main theories. One is *determinism*, which means the environment shapes the culture. For example, Hofstede used some of this to explain the root of collectivism and individualism. Then we have *possibilism* which is almost the opposite of determinism, i.e. humans exploit the environment for their benefits. And a middle way is cultural *ecology*, which sees culture as a strategy to interactively deal with environment rather than passively being shaped or actively exploit the environment.

1. **Culture is genetically inherited**

Ok, now things get interesting. What do genes do in our cultural evolution? Do they have a role or are they strangers hitchhiking in the same bus? We are very lucky to have Peter Richerson here – a leading biologist in the field. Peter, I must share that because of you, I decided to study neuroscience. I was hoping that in your keynote, you would talk about the dual inheritance, which you are known for. We got a glimpse of it, that culture and genes co-evolve to help us survive. So useful cultural values such as collectivism is supported by some genetic traits, and these genetic traits reinforce this useful value across generations.



I'm going to give you an example. To understand this example, let's get familiar first two terminologies. First, pathogens. They are viruses and bacteria that easily cause diseases, especially in tropical areas such as Asia. Second, the gene that codes serotonin transporter has a short version that has been linked to depression and emotional sensitivity, called s5-HTTLPR.

I would like to show you a study of Chiao and Blizinsky (2009). Here is a map of depression genes, and here is the level of collectivism and individualism in different regions of the world. It is a bit hard to see, but there is a statistics correlation. Basically, people in Asia with collectivistic value have double the chance of carrying depression genes. Does that mean they also have a higher chance of being depressed? The answer is, NO. In fact, they have less, despite having higher chance of carrying depression genes. Why is it?

So, let's go back in time. When our ancestors migrated to Asia, this region had a high load of pathogens. In order to cope with the constant risk of infection, they slowly developed a cultural strategy to deal with the environmental risk: Collectivism and High Power distance. This mindset enabled tribe members to conform to collective rules, respect authorities, regarding sanitation and food preparation. Those who followed these culture rules had better chance to survive.

The interesting thing is that those with emotional sensitive genes seem to need and fit well in the requirement of these cultural values. Need- Because these values give them social support and predictability to mitigate the impact of negative emotions. Fit: because these values are important for survival in an environments with high pathogen loads. Hence, genes and cultural values co-evolve.

Now I've notice that some of you start looking at me with sympathy, not because I flew in all the way from Australia and look terribly jetlagged. But because even though I have dyed my hair blond, I am clearly Asian. That

means I have double the chance of carrying depression genes, and because I mostly live in Europe and Australia without family support and strong authority rules, how can I survive? And then you may think of your colleagues and "Oh dear maybe they need a bossy boss and democracy is not what they want"….Please, slow down.

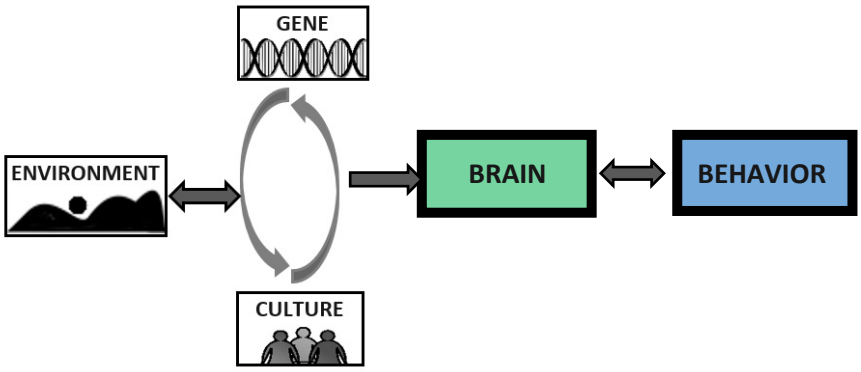
Did you see how quickly talking about gene can escalate and lead to racism and eugenics? And that is exactly the reason why many of us prefer and even choose behaviorism. We just don't want to be controlled by some uncontrollable biology, because it can easily lead to discrimination.

However, we need to know that things are never so simple. There are many complex factors and processes involved. And this is just one of them: The gene-culture interaction model. It posits that the same gene can lead to opposite cultural behaviors because genes support cultural adaption. For example, let's get back to the depression gene. Those who carry this short version is much more sensitive to facial expression, but ONLY in Japanese context where this behavior is in line with the preferable cultural value (Ishii et al., 2014).

So, this insight from cultural neuroscience can open many new direction of research. For example, what is the implication for international mobility, HR support, and immigration? How can we address the controversial issues of genetic scanning in recruitment? How can we keep the scientific spirit yet avoid the negative and incorrect interpretation that will fuels eugenics and nationalism?…Etc. So as you can see, here is absolutely the case of promising and controversial issues go hand in hand.

2. Cultural is neutrally enable

Next, we move to the notion that culture is neurally enabled. So here, the brain is added to the picture, because this organ also has an incredible mechanism to help us adapt to and create a new culture.



Working through behaviours, what we have here is brain plasticity. It means to a certain extent, the brain can changes with exercises. Repeated behaviours can lead to some changes in the brain's structure and function, in accordance with the way we think and act.

Here is a time-lapse video of how neurons growth on a dish, which gives us an idea of how they work in our brain when we learn a new skill or, well, listen to a keynote. It is fascinating to see how every thought is rewiring our brain so we can forge new path ways, start a new habit, and adapt to different cultures, and create a new culture if that is needed.

Here is a model I created to visualize the mechanism. Two neurons communicate with each other by sending neurotransmitters, which will dock on receptors. If we repeat a certain thought, an action or a ritual frequently enough, the dendrite will grow bigger, there will be more neurotransmitters and receptors. Eventually, the neuron will grow a new branch, and the sending-receiving of neurotransmitters become super quick, effortless, even subconscious.

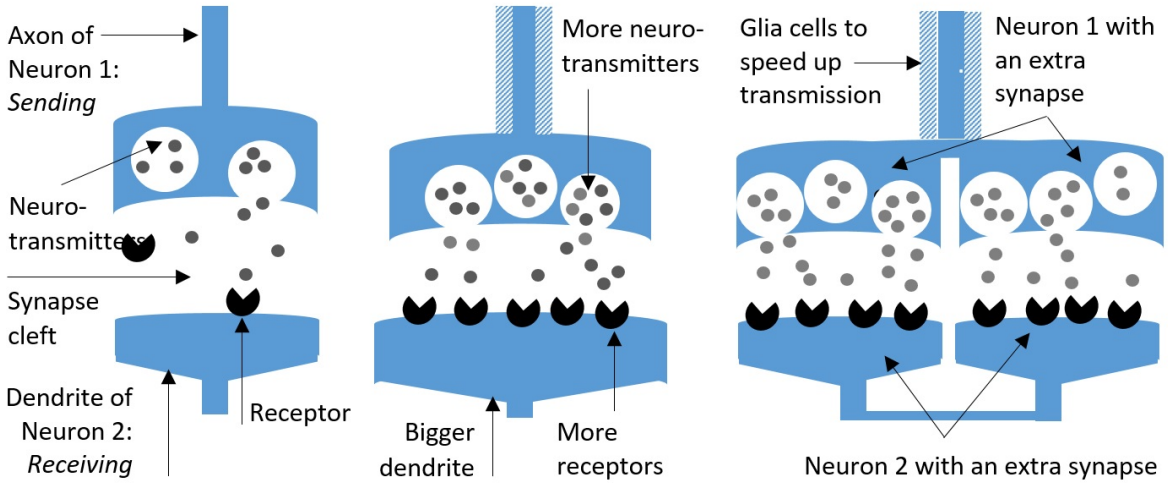


Figure 2- Long term Potentiation (Nguyen-Phuong-Mai, 2017: 31)

Here is an example of how culture is expressed via neural pathway. In our brain, the amygdala detects emotions, and the number one priority is fear, because it keeps us safe. The anterior cingulate cortex is responsible for, among others, detecting errors in judgement. This study shows that those who hold conservative views have bigger amygdala and smaller ACC (Kanai, 2011). Can this explain why conservatives are more sensitive to fear (hence, bigger amygdala), and more prone to error in judgement (hence, smaller ACC)? And the more interesting question is, were they born that way, or have they become that way? Or both?

I will leave that question to you and move on to talk about a much more promising aspect of brain plasticity: multicultural mind. A prominent researcher in this topic is Ying-Yi Hong – and she is right here with us. We know that with repeated behavior, our brain can change. But sometimes, that is not even needed. Ying-Yi-Hong proposes that, to a certain extent, our brain can host opposite values at the same time, and switch between them depending on cultural contexts.

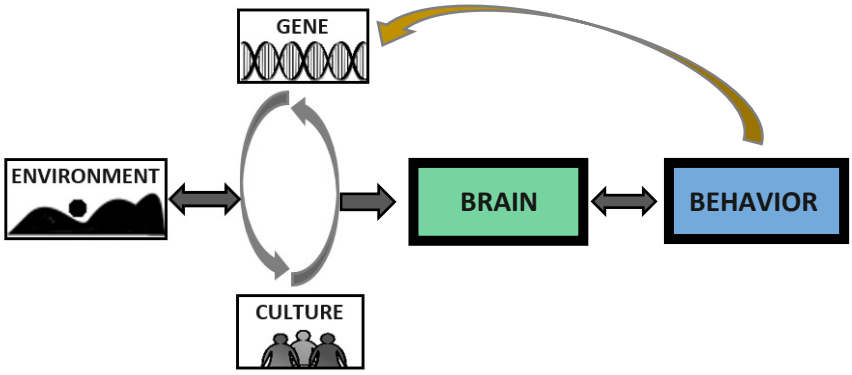
So in this study (MacDonald et al., 2008), Canadian participants were primed by reading a text which contains different pronouns, 19 in each text, to be precise. As a consequence, they prefer different kinds of leadership. Those who read text plural pronouns preferred transformational leadership – a leadership style that prioritizes close relationship and trust. Those who read text with singular pronouns preferred transactional leadership – a leadership style that is more associated with personal performance.

Such an approach to neuroscience is very promising, since it can influence policies that aim at developing and training a global workforce or an international community with a strong sense of cultural awareness, adaptation and flexibility mindset. It gives multiculturalism a chance. It also supports the hypothesis that multicultural mind can be an evolutionary strategy that helps humans to cope with a fast changing world.

3. Culture is Genetically Inherited (PART 2)

Now that we talk about behavior, it is important to add a new layer of knowledge to the notion that culture is genetically inherited.

The concept I want to bring here is epigenetics, which means repeated behavior can change genes' activities. Note that we cannot change genes, just how they work. DNA is pretty much fixed, like the structure of lights in this conference room. But our cultural practices can act like switches that can turn a gene on and off, so to speak.



The point I want to make is that these changes last for a few generations. So if you turn off these lights in this conference, in the next 4 conferences, people may have no light at all. We inherit from our parents not just genes, but also how genes work.

How does this impact culture at large? Take a look at this study (Galanter et al., 2017). When researchers compared two Spanish speaking populations in Puerto Rico and Mexico, they found out that 25% of difference in gene expression (so turning on or off) is due to differences in cultural practices. Because DNA can't quickly change to help humans adapt via genetic mutations, epigenetics is a "medium-term" mechanism to help us adapt and create a suitable culture much more rapidly (Osborne, 2017). Our ancestors pass on cultural psychology and practices to the future generation, NOT by social learning, but through biological inheritance. If you look at immigrant families where culture is often strong for several generations, this is not a crazy hypothesis at all. This supports the hypothesis that cultural psychology and practices can transmit to future generations, not by social learning, but through biological inheritance.

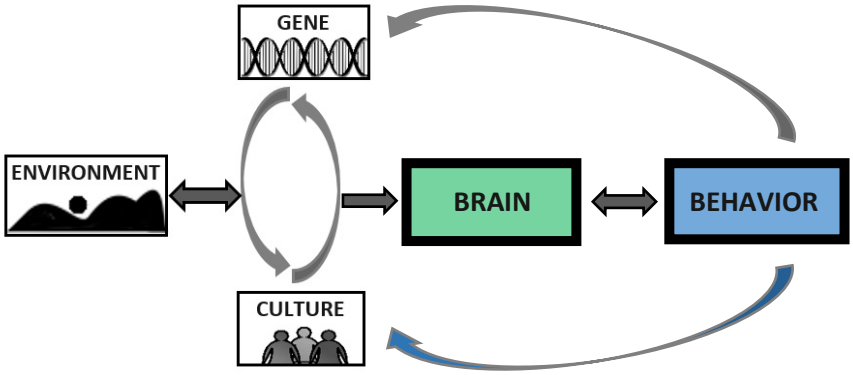
And sometimes, what they passed on is not so nice. Here are two more examples (Tobi, 2014; Yehuda et al., 2016). In both cases, the third generation of those who suffered from the famine and holocaust, even when they did not experience the hunger and genocide themselves, still inherited the trauma in term of epigenetics. So, as much as people can inherit trauma from distant ancestors, members of a collective can inherit numerous cultural values and practices via transgenerational epigenetic inheritance.

This, of course, has significant implication in how we look at policies at the macro level: insurance, welfare, international mobility, etc. What also comes to my mind is the way we have formed so many new cultural practices: anti-vax, C-section, sedentary office work, digital life, constant fear of missing out, 24/7 media update, new way of socializing, new diets, etc. You name it. It is critical that we know how this new way of life will influence our future generations through epigenetic marks.

4. **Culture is Socially learned**

Back to our first standpoint that culture is socially learned. This is where it fits in this model, which is the interaction between culture and behaviors. However, this interaction is often one-sided in the theories. While there are nuances,

two main paradigms are static vs. dynamic. The static paradigm, dominated by most theories, is strongly concerned about how culture shapes behaviors. The dynamic paradigm, with much less influence, proposes that culture not only shapes behaviors, but also changes because of behaviors.



I will show you two examples. In both cases, the value may be disliked at the beginning (Grunberger, 1995; Sudbeck, 2012). Many Germans opposed the idea of Nazi, and many Chinese opposed the idea of having only one child. Yet, they were forced to act the opposite. When we have a conflict between our belief and our action, in many cases, we will change our belief to fit the behavior. These studies show that even deep-seated values can change in wider population as a result collective behaviors. In China, the perception of girls change because they are now seen as bread winner just like boys. And even when the ban is lifted, many women do not want to have a second child.

I have thought a lot about how this one-sided representation has influenced us by strongly emphasizing one direction of culture shapes behavior, and not the other way around. Why? Because it can undermine the human role as active agents of culture. I myself do find it very conflicting to tell my students that, according to the mainstream theory, we are the products of our culture, yet we expect ourselves to be the change we want to see.

I will show you this video as an example. It is about an all-female prison where violence is the reality of everyday life. But the management decided to run a game called compassion game. Prisoners could log in points for doing compassion acts such as helping each other to clean up their living spaces. During 11-day trial, there were 4600 acts of compassion and no act of violence. The game transformed the prison's culture. Collective behaviors can change culture. And thus, culture not only shapes behaviors, but also changes because of behaviors.

5. Conclusion

In this presentation, I have quickly showed the evidence that when we talk about culture, it is not enough to only focus on how it is socially learned. Culture is not static, and does not exist in a vacuum, away from the flesh and blood of human beings. The question of nature/nurture has been scientifically answered that it is the combination. When you hear the drum, does it because of the drum or because of the drummer? The answer is both.

The metaphor that culture is a software of the mind is easy to understand, but it does not seem to cover all critical aspects of culture, especially when we look at it from an interdisciplinary perspective. Personally, it does make me wonder who created the software in the first place, who updates it, and when it is controlling our mind, who is behind the keyboard?

What really important is that if we so strongly reject one extreme which is biological determinism, why are we still adopting another extreme which is cultural determinism? There must be a hypothesis that represents the

synergy. And with that concern, this is what I tell my students, taken the term used by biologist Mark Pagel, that *culture is a survival strategy*. We are influenced by a strategy, but we can change the strategy as well. We co-evolve.

I know I have gone really quickly through an extremely complex question. So I hope to be able to discuss more in depth with you during the conference. When they are ready, I will be more than happy to send you the working version of an article in which I elaborate all the studies involved, and a sample chapter of my up and coming book on cross-cultural management with insight from brain science. Thank you.

_____

References

Chiao, J., & Blizinsky, K. (2009). Culture-gene coevolution of individualism-collectivism and the serotonin transporter gene. *Proceedings of The Royal Society B: Biological Sciences*, *277*(1681), 529-537. doi: 10.1098/rspb.2009.1650

Galanter, J. M., Gignoux, C. R., Oh, S. S., Torgerson, D., Pino-Yanes, M., Thakur, N., ... & Avila, P. C. (2017). Differential methylation between ethnic sub-groups reflects the effect of genetic ancestry and environmental exposures. *Elife*, *6*, e20532.

Grunberger, R. (1995). *The 12-year Reich: A social history of Nazi Germany 1933-1945*. Da Capo Press.

Hong, Y. Y., Morris, M. W., Chiu, C. Y., & Benet-Martinez, V. (2000). Multicultural minds: A dynamic constructivist approach to culture and cognition. *American psychologist*, *55*(7), 709.Ishii, K., Kim, H., Sasaki, J., Shinada, M., & Kusumi, I. (2014). Culture modulates sensitivity to the disappearance of facial expressions associated with serotonin transporter polymorphism (5-HTTLPR). *Culture And Brain*, *2*(1), 72-88. doi: 10.1007/s40167-014-0014-8

Kanai, R., Feilden, T., Firth, C., & Rees, G. (2011). Political orientations are correlated with brain structure in young adults. *Current biology*, *21*(8), 677-680..

MacDonald, H. A., Sulsky, L. M., & Brown, D. J. (2008). Leadership and perceiver cognition: Examining the role of self-identity in implicit leadership theories. *Human Performance*, *21*(4), 333-353.

Nguyen-Phuong-Mai, M. (2017). *Intercultural communication: An interdisciplinary approach: When neurons, genes, and evolution joined the discourse*. Amsterdam University Press.

Sudbeck, K. (2012). The Effects of China's One-Child Policy: The Significance for Chinese Women.

Tobi, E. W., Goeman, J. J., Monajemi, R., Gu, H., Putter, H., Zhang, Y., ... & Van Zwet, E. W. (2014). DNA methylation signatures link prenatal famine exposure to growth and metabolism. *Nature communications*, *5*, 5592

Yehuda, R., Daskalakis, N. P., Bierer, L. M., Bader, H. N., Klengel, T., Holsboer, F., & Binder, E. B. (2016). Holocaust exposure induced intergenerational effects on FKBP5 methylation. *Biological psychiatry*, *80*(5), 372-380.

FORTHCOMING (September 2019)

Cross-Cultural Management:
With Insight from Brain Science

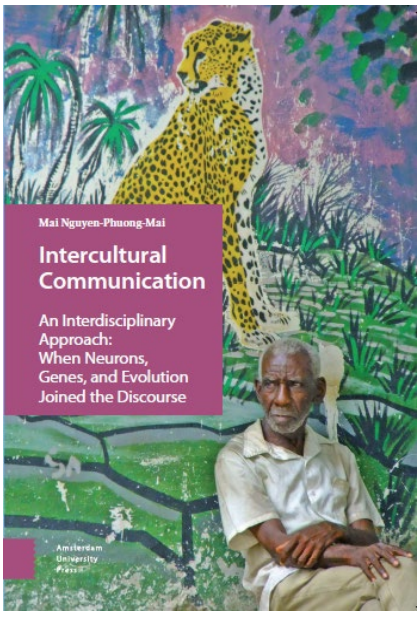
This book from Routledge is a comprehensive read for both students and professionals alike. It discusses the cultural perspective of Globalization, Leadership, Motivation, Negotiation, and Marketing, and adds other contemporary topics such as Diversity Management, Change Management, and Bias Management.

From the methodological point of view, this book offers a refreshing perspective by incorporating insight from evolutionary biology and cultural neuroscience. All chapters start with insight contributed from the brain science's point of view. For example, the chapter on cultural values also explain how genes play a role in forming values such as power distance, collectivism- individualism, and uncertainty avoidance. The chapter on Change Management explains from the brain science's perspective why change is difficult, and how individuals and organizations can take insight from brain science to make changes happen. The book is ideal for courses in cross-cultural communication/ management with study cases, discussion topics and class activities.

Pre-order at

https://www.routledge.com/Cross-cultural-Management/Nguyen-Phuong-Mai/p/book/9781138304666

RELEASED (May 2017)



Intercultural Communication – An Interdisciplinary Approach:
When Neurons, Genes and Evolution Joined the Discourse

This book is an introduction to Intercultural Communication (IC) that takes into account the much neglected dynamic paradigm of culture in the literature. It posits that culture is not static, context is the driving force for change, and individuals can develop a multicultural mind. It is also the first IC textbook in the field that incorporates some insight from evolutionary biology and the newly emerging discipline of cultural neurosciences. Such an interdisciplinary approach provides readers with new angles, encourages critical thinking, and sometimes challenges conventional knowledge in the field. The combination of the author's multicultural academic and journalistic background contributes to a balance of diverse perspectives and world views on cultural theories and discourses. The book is ideal for courses in Intercultural Communication with study cases, discussion topics and class activities.

Order at

https://www.aup.nl/en/book/9789462985414/intercultural-communication