

Intercultura

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2019

Nuove idee sulla cultura

Dalle ricerche dei neuroscienziati
negli ultimi decenni

Natura e cultura

L'eterno problema
della trasmissione culturale

Software e hardware

Relazioni e condizionamenti
nel comportamento umano



TABULA RASA? NEUROSCIENZE E CULTURE

In questo numero

**TABULA RASA?
NEUROSCIENZE E CULTURE
A BLANK SLATE?
BRAIN SCIENCE AND CULTURES
FIRENZE, 4-6 APRILE 2019**

REDAZIONE

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Via Gracco del Secco 100
53034 Colle di Val d'Elsa
tel: 0577 900001
www.fondazioneintercultura.org
mail: segreteria@intercultura.it

DIRETTORE RESPONSABILE

Carlo Fusaro

GRAFICA E IMPAGINAZIONE

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Dal 4 al 6 aprile 2019 la Fondazione Intercultura ha invitato a Firenze neuroscienziati, genetisti, filosofi e antropologi da tutto il mondo per discutere di trasmissibilità delle culture. Il titolo del convegno, cui hanno partecipato parecchie centinaia di volontari dell'Associazione Intercultura, formatori di comunicazione interculturale e rappresentanti di agenzie educative, era "Tabula rasa? Neuroscienze e culture". Gli Atti sono in corso di pubblicazione. Anticipiamo in questo numero alcune relazioni d'apertura, le conclusioni di Roberto Toscano ed una riflessione di Renato Di Chiara Stanca.

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Fondazione
Intercultura
onlus

La Fondazione Intercultura Onlus

La Fondazione Intercultura Onlus nasce il 12 maggio 2007 da una costola dell'Associazione che porta lo stesso nome e che da oltre 60 anni accumula un patrimonio unico di esperienze educative internazionali, che la Fondazione intende utilizzare su più vasta scala, favorendo una cultura del dialogo e dello scambio interculturale tra i giovani e sviluppando ricerche, programmi e strutture che aiutino le nuove generazioni ad aprirsi al mondo ed a vivere da cittadini consapevoli e preparati in una società multiculturale. Vi hanno aderito i Ministeri degli Affari Esteri e dell'Istruzione, Università e Ricerca. La Fondazione è presieduta dall'Ambasciatore Roberto Toscano; segretario generale è Roberto Ruffino; del consiglio e del comitato scientifico fanno parte eminenti rappresentanti del

mondo della cultura, dell'economia e dell'università. La Fondazione Intercultura promuove convegni internazionali su temi legati alle culture e organizza annualmente incontri tra interculturalisti di vari Paesi. È ente di formazione accreditato al MIUR e propone corsi e seminari per docenti e dirigenti scolastici. Sostiene ricerche sull'apprendimento interculturale; ha condotto un progetto pilota di scambi intra-europei con l'Unione Europea. Raccoglie donazioni per borse di studio di enti locali, fondazioni ed aziende a beneficio dei programmi di Intercultura. Gestisce il sito www.scuoleinternazionali.org

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There is no blank slate: the role of geography, genes, brain and behavior in shaping culture



L'Associazione Intercultura Onlus

L'Associazione Intercultura Onlus (fondata nel 1955) è un ente morale riconosciuto con DPR n. 578/85, posto sotto la tutela del Ministero degli Affari Esteri. Dal 1 gennaio 1998 ha status di Organizzazione non lucrativa di utilità sociale, iscritta al registro delle associazioni di volontariato del Lazio: è infatti gestita e amministrata da migliaia di volontari, che hanno scelto di operare nel settore educativo e scolastico, per sensibilizzarlo alla dimensione internazionale. È presente in 157 città italiane ed in 65 Paesi di tutti i continenti, attraverso la sua affiliazione all'AFS ed all'EFIL. Ha statuto consultivo all'UNESCO e al Consiglio d'Europa e collabora ad alcuni progetti dell'Unione Europea. Ha rapporti con i nostri Ministeri degli Esteri e dell'Istruzione, Università e Ricerca. A Intercultura sono stati assegnati il Premio della Cultura della Presidenza del Consiglio e il Premio della Solidarietà della Fondazione Italiana per il Volontariato

per oltre 40 anni di attività in favore della pace e della conoscenza fra i popoli. L'Associazione promuove, organizza e finanzia scambi ed esperienze interculturali, inviando ogni anno oltre 2000 ragazzi delle scuole secondarie a vivere e studiare all'estero ed accogliendo nel nostro paese altrettanti giovani di ogni nazione che scelgono di arricchirsi culturalmente trascorrendo un periodo di vita nelle nostre famiglie e nelle nostre scuole. Inoltre Intercultura organizza seminari, conferenze, corsi di formazione e di aggiornamento per Presidi, insegnanti, volontari della propria e di altre associazioni, sugli scambi culturali. Tutto questo per favorire l'incontro e il dialogo tra persone di tradizioni culturali diverse ed aiutarle a comprenderci e a collaborare in modo costruttivo.

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There is no blank slate: the role of geography, genes, brain and behavior in shaping culture



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*Mai Nguyen-Phuong-Mai,
Associate Professor at
Amsterdam School of
International Business
(AMSIB).*

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 Durkheim – 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.

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.

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

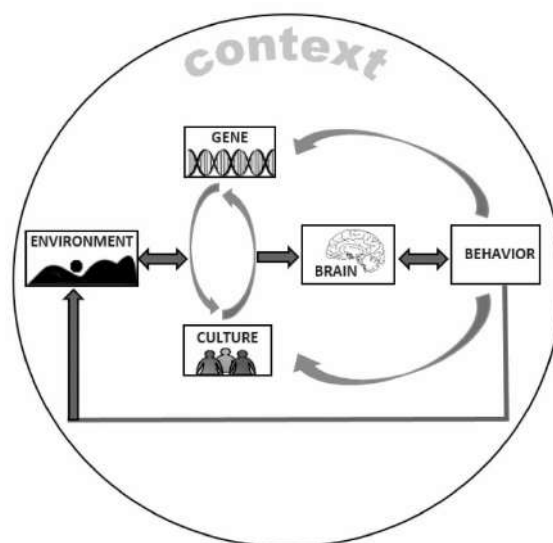
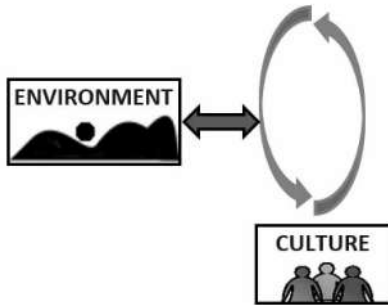
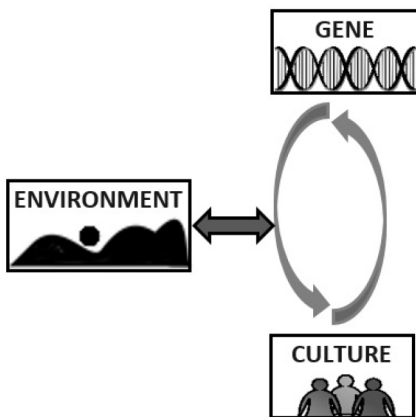


Figure 1: *The Diagram of Diversity Pathways*
 (Nguyen-Phuong-Mai, 2017: 34)



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.



2. 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.

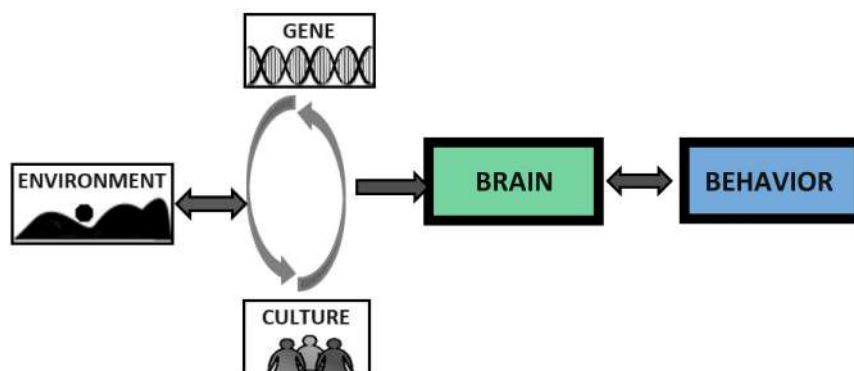
However, we need to know that things are never so simple. There are many complex factors and processes involved. And this is just one of them: The gene-culture interaction model. It posits that the same gene can lead to opposite cultural behaviors because genes support cultural adaption. For example, 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.

3. CULTURE IS NEURALLY ENABLED

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.

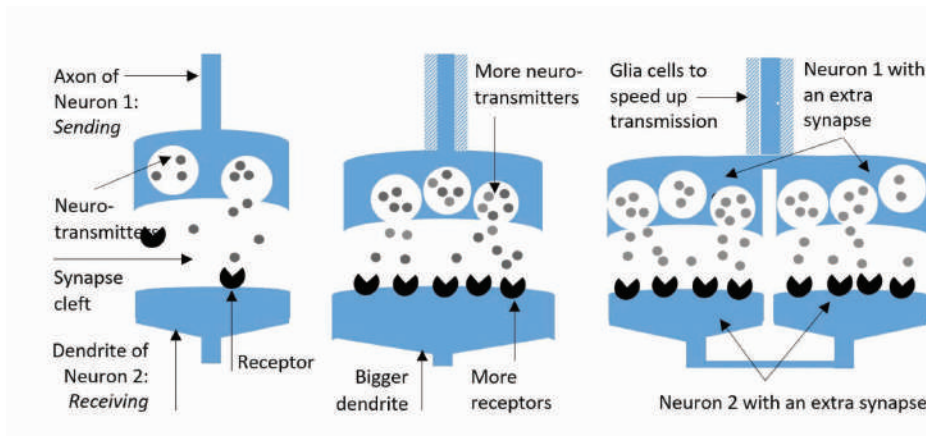


Figure 2: Long term Potentiation
(Nguyen-Phuong-Mai, 2017: 31)

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.

4. 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.

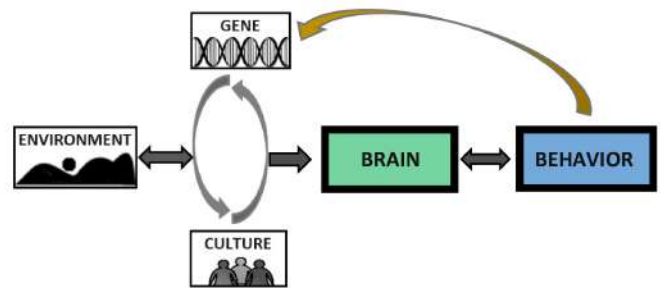
But our cultural practices can act like switches that can turn a gene on and off, so to speak.

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.

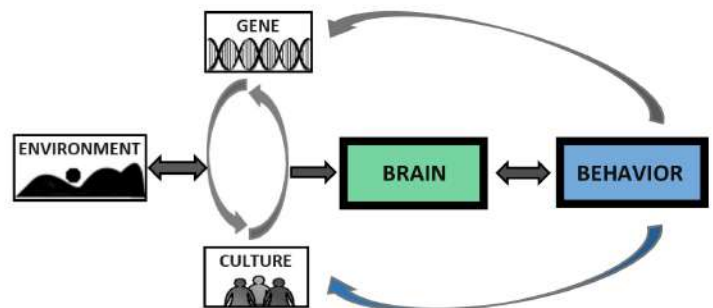
And sometimes, what they passed on is not so nice. Here are two more examples (Tobi, 2014; Yehuda et al., 2016). In both cases, the third generation of those who suffered from the famine and holocaust, even when they did not experience the hunger and genocide themselves, still inherited the trauma in 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.



5. 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.

What is 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?

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.

6. CONCLUSIONS

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 is 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.

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