

**Eileen Dombrowski**  
**with guest posts from Theo Dombrowski**

# Theory of Knowledge

2016 Blog Posts

Blog posts compiled January 2017 for handy reference:

### **Oxford Education Blog**

<http://educationblog.oup.com/category/theory-of-knowledge>



### **To teachers of IB Theory of Knowledge:**

We've compiled these posts into a downloadable document so that you can cruise them quickly, looking for good ideas for your own teaching. Our emphasis throughout is on thinking skills, applied to the world.

You are welcome to use and share this document.  
Eileen and Theo

For even more inspirational TOK teaching ideas and resources,  
explore our website and Facebook page:

**Activating TOK: thinking clearly in the world**

<https://activatingtok.net/>

 [www.facebook.com/activatingtok/](https://www.facebook.com/activatingtok/)

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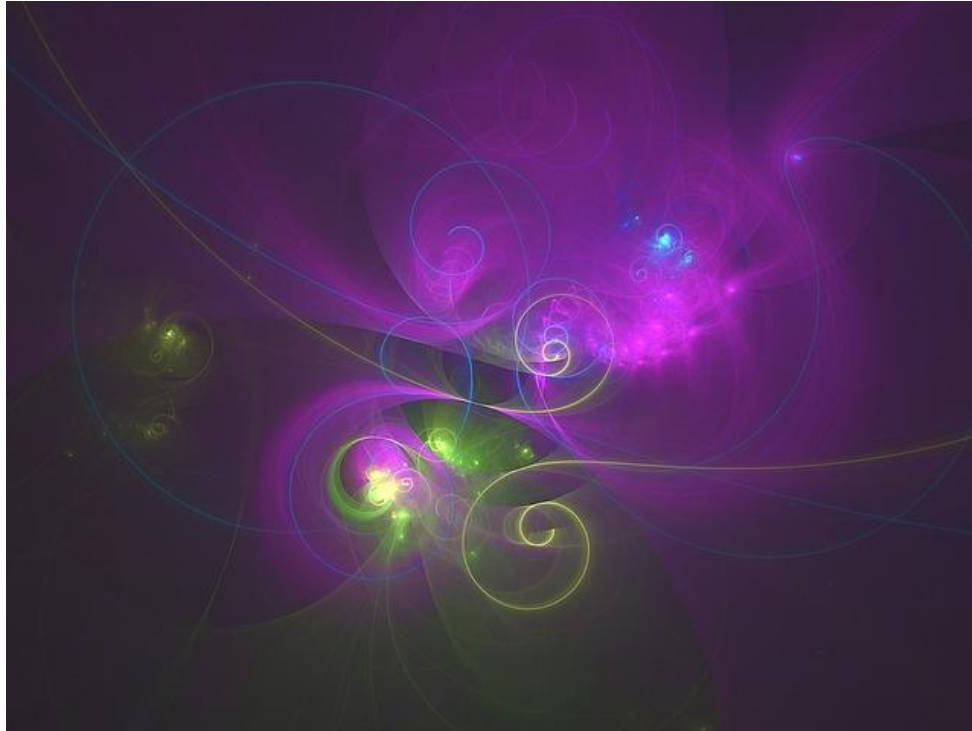
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## Real Scientific Literacy for TOK



(by Eileen Dombrowski) What an excellent summary of how science works! You'll be missing out on a splendid resource if you *don't* read these two articles on "Real Scientific Literacy" offered just last week (free, on his blog) by neurologist and science writer Dr. Steven Novella:

[Real Scientific Literacy](#), The Ness, Neurologicablog, January 12, 2016.

[Real Scientific Literacy, Part II](#), The Ness, Neurologicablog, January 14, 2016.

In his conclusion, Dr. Novella makes a simple assertion that underscores what we teach in IB science courses and IB Theory of Knowledge: "Scientific literacy means not only having a working understanding of the big ideas of science, but also understanding critical thinking and how science works."

In this compact outline of how science works, Dr. Novella suggests ten features, or **ten categories, of scientific literacy and elaborates on each one**. "These ten categories of literacy regarding the scientific process," he says, "are meant to be a quick overview of the basics, what I consider to be the minimum that anyone should know in order to be truly scientifically literate."

1. Scientific Knowledge
2. Science is an empirical and logical process
3. Science uses multiple logical methods
4. Science is tentative, and always has error bars
5. How to Analyze a Scientific Study
6. Most Studies are Wrong or Incomplete
7. Consensus Matters
8. Understand Pseudoscience
9. Understand Denialism
10. Understand that humans are flawed and biased.

What is the best way to use an excellent compact summary like this one within our TOK course? As you can tell from my enthusiastic comments on this pair of blog posts, I think that *every* TOK teacher should read them. "You just *gotta* read this! It's just soooooo good!"

Is that enough? Well, yes. Maybe it is. Reinforcing our own understanding as teachers, especially on parts of the course that lie outside our own expertise, is a continuing responsibility and pleasure for us as teachers. One of the joys of teaching TOK is being stimulated, again and again, to read and think.

But would I hand this summary to my own students to read? Well, if I were compiling a background list of good resources in any case, I'd certainly include it. I'd also quote bits of it in class when dealing with relevant topics. (I will surely be quoting Novella in this blog later on.)

But I wouldn't hand this summary to students to read in class. I wouldn't base a class on consuming good materials, in which somebody smart has already done all the thinking! I'd rather give students flawed materials to critique themselves, or, better yet, activities to generate their own ideas and expression.

So this is a resource for us – for teachers. Thank you, Dr. Steven Novella!

## References

Real Scientific Literacy, The Ness, Neurologicablog, January 12, 2016. <http://theness.com/neurologicablog/index.php/real-scientific-literacy/>

Real Scientific Literacy, Part II, The Ness, Neurologicablog, January 14, 2016. <http://theness.com/neurologicablog/index.php/real-scientific-literacy-part-ii/>

image by PeteLindforth, pixabay <https://pixabay.com/en/space-fractal-science-backdrop-1095783/>

January 25, 2016

## The human beings behind knowledge: some resources for Indigenous Knowledge

(by Eileen Dombrowski) To appreciate knowledge as a human achievement, we want to humanize the contributors to it, the people who work within every field of knowledge. We want to bring to imaginative life their creativity, fallibility, clever methods to overcome fallibility, and splendidly diverse achievements. We want to bring to life, too, what their knowledge means – to them, to their field, to us.

There is one area of knowledge where it is essential to engage our students imaginatively for them to grasp what the area of knowledge is even about. I'm referring to Indigenous Knowledge, where the knowledge is seemingly defined by *who* possesses it. In this area of knowledge, many of the knowledge questions we want to pose can be asked with understanding and grasp of implications *only* if we have some awareness of culture and history.

Where students come to TOK class already having studied many of the academic areas of knowledge for some time, they often have little background on indigenous peoples and their issues. Our role in TOK is not to give them extensive historical information – we're not primarily an information-giving class. Yet we might want to provide them with some exposure not just to general issues but to people's stories so that, through imaginative engagement, they might understand better the topics we discuss within Indigenous Knowledge.

But how? Myself, I think **literature** can play a major role here, particularly literature by indigenous authors. If the literature teacher in your school chooses such a novel, you have a means of collaboration immediately! (Myself, I enjoyed teaching Silko's *Ceremony* in English A.)

### Three Resources

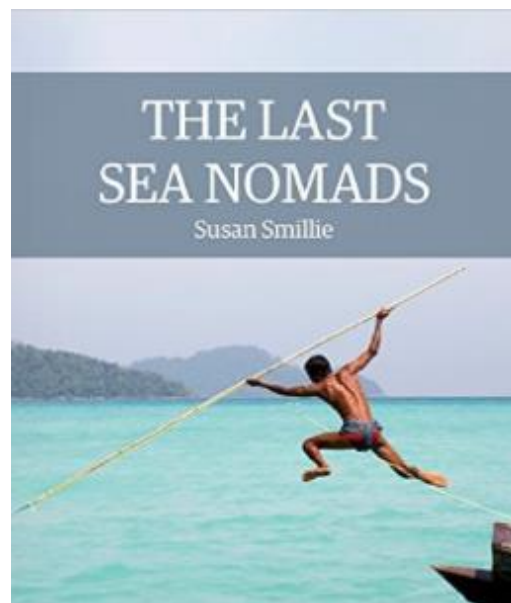
Today, though, I'll pass on three resources that have come my way that you might find useful in *thinking about* how to lead your students into the indigenous experience.

One is a wonderful [series of photographs](#) of American Indians available on youtube. In about 10 minutes of magnificent photographs by Edward Curtis, the film gives human faces to the abstraction "indigenous knowledge". It's a pleasure to watch.





Another is a very **short historical account**, with personalities and stories, of the Moken community off the coast of Thailand: [Susan Smillie's \*The Last of the Sea Nomads\*](#). I found it engaging and moving as it deals with the Mokens trying to survive in a world changing around them. It would be hard *not* to recognize and appreciate their knowledge and their connection with their world. It's just 56 pages and available very inexpensively as an e-book and an audio download.



The third resource is substantial and serious – a resource for you as a teacher doing back-reading. The **Canadian Truth and Reconciliation Commission** reached the end of its process late in 2015 with the publication of a series of reports now downloadable free from the internet: [National Centre for Truth and Reconciliation](#). These reports document the experience of Canadian indigenous people in the residential schools set up by the government. They separated children from their families, by force, in order to give them the education that the white Europeans in power considered to be the most useful for integrating them into a white European worldview and economic system. The residential

school system was in part about what *knowledge* indigenous children should be given, but it was also about power and control.



National Centre for  
Truth and Reconciliation  
UNIVERSITY OF MANITOBA

But what did the residential school system do *in practice* to indigenous people and indigenous knowledge? So far, I've read the summary *Honouring the Past, Reconciling for the Future*. It's well over 500 pages long. I found it hard to read – not because it was unclear but because it was heartbreaking. If you're interested but haven't the time to read a long paper, you will get a sense of its contents in this shorter article: "[14 first-hand stories underlining how residential schools tried to "get rid" of Indigenous cultures](#)".

Personally, I see the Truth and Reconciliation Commission as providing knowledge that all of us should gain, if we don't know already. Even if we're not TOK teachers preparing classes, I think we're responsible for knowing. But this might be a topic for another day!

## Resources

Edward Curtis' Life and Photography. youtube. <https://www.youtube.com/watch?v=czjvrXSoSaU>

Susan Smillie, *The Last Sea Nomads*. <http://www.amazon.co.uk/Last-Sea-Nomads-disappearing-Guardian-ebook/dp/B00QTWC5OC/>

*Honouring the Past, Reconciling for the Future*. The National Centre for Truth and Reconciliation, Canada. <http://nctr.ca/reports.php>

"14 first-hand stories underlining how residential schools tried to "get rid" of Indigenous cultures". Press Progress.

[http://www.pressprogress.ca/14 first hand stories underlining how residential schools tried to get rid of indigenous cultures?utm\\_campaign=dec19\\_15ppwkc&utm\\_medium=email&utm\\_source=broadbent](http://www.pressprogress.ca/14-first-hand-stories-underlining-how-residential-schools-tried-to-get-rid-of-indigenous-cultures?utm_campaign=dec19_15ppwkc&utm_medium=email&utm_source=broadbent)

February 1, 2016

## Orange cone dress protests pollution: art engages with the world



(by Theo Dombrowski) [The image is striking.](#) A woman walks through the streets of Beijing dressed in a strange gown with a long--orange--cape trailing along the ground. But wait. What is the gown made from? Well, strange to say, what at first glance might seem like ruffles, are actually plastic cones or horns.

The woman is called Kong Ning and her creation of this orange dress provides TOK teachers with a striking current story to challenge and provoke students into considering complex--and *vital*--ways in which the Arts function as an area of knowledge.

One way of handling this example in class is to provide an image of the orange dress (see "[How Artists Are Fighting Air Pollution in Beijing](#)") and raise questions in roughly the order outlined below. I have linked many of them directly with the [TOK Course Book](#) in order to provide an example that can be framed by the knowledge questions and exploration set up in the book.

### 1. Social and Cultural Contexts--and "Perspectives"

From the very "get go", many TOK students may be reluctant to accept that there is any point at all to Kong Ning's "art". If art is about communicating, particularly **shared knowledge** what possibly can they conclude about the "meaning" of this piece of performance art?

Although TOK students in China probably will not need to be told these three facts, those elsewhere may not know them:

- First, orange is the colour used to indicate an extreme level of air pollution in Beijing.

- Another fact most may know, but may need to be reminded of, is that a cone shaped horn is frequently used for warning.
- Third, [according to one study](#), 1.6 million people a year are currently dying directly or indirectly from air pollution in China.

Armed, therefore, with this background knowledge, students will no doubt be quick to accept that yes, well maybe, here is an act of communication after all. And, more to the point, as the [TOK Course Book](#) says, "The arts *communicate*... Usually the communication is from the artist...to an audience. The communication has a purpose, and is set within a perspective. "

A first question for discussion then: *for this communication to be successful how much can this particular work of art--or any work of art--be divorced from its cultural and social context? Is art "better" if it can be understood more or less universally without such an expectation?*

Further, *how much background knowledge should be **necessary** to appreciate art?* In the [TOK Course Book](#) one suggested discussion is based around evaluating the following claim: "...a response that is based on some understanding of the meaning of a work within its context--the context of the culture and the context of expectations of that particular form of art--is a fuller response." (p. 237) Our orange dress clearly provides an excellent example on which to base some thoughtful mulling.

*ASIDE: This question often arises in art in relation to social satire. Many Language A1 students will know that "satire" is generally understood to involve the use of exaggeration and irony to ridicule and therefore posit a "norm", that is, a valuable principle. As such, social satire is often linked to a particular time and place--and sometimes, therefore, seen as inferior as "art". Does the example of the orange dress provide ammunition for exploring this question?*

## 2. Symbolism

Any discussion following these questions could well touch on the question of symbolism and how symbols communicate knowledge--after all, both the colour orange and the cone shape are **symbols** that acquire their "meaning" from their cultural/social context. Not all artistic symbols need to be cultural, of course. After all, Kong Ning is wearing a dress, and what appears, moreover, to be a wedding dress. What are we to make of that?

This gives rise, therefore, to a second cluster of questions:

- *In what ways can art (including writing, dance, music and so on) communicate shared knowledge through symbol, both cultural symbols and those that acquire resonance by the manner in which the artist treats them?*
- *Does the use of symbols as a method of communication make the knowledge claims more powerfully or less powerfully felt and/or understood than direct statement would?*

- *Does the subjective element in interpreting symbols, sometimes strong, sometimes not, weaken the communication?*

### 3. Indirection and subtlety

By this point, some students will probably be impatient. After all, some will say, what is to be gained by beating around the bush whether through symbols or not? They will be particularly satisfied to know that Kong Ning's art has, in fact, been misunderstood. Many passersby in Beijing apparently had no idea what she was trying to communicate!

From here, then, springs a further question in the arts: whether or not symbols are involved, how much does true artistry involve some subtlety and indirection? Many a protest **song**, for example, lays its cards directly on the table. For instance, the environmental message in [Tracy Chapman's "The Rape of the World"](#) is not exactly subtle:

We are all witness  
To the rape of the world...  
You've seen her strip mined  
You've heard of bombs exploded underground...  
She has been clear-cut  
She has been dumped on  
She has been poisoned and beaten up  
And we have been witness  
To the rape of the world.

Put that song beside Kong Ning's orange dress and the orange dress seems more than a little indirect. *Does, this mean, however, that its meaning is less valid? that artistically it has less--or more--value? that because of its very indirection it can have greater impact?*

### 4. Subtlety and propaganda

One of the questions for reflection in the *TOK Course Book* is "What distinguishes propaganda from art that expresses a point of view"? (p. 242).

Students who haven't already discussed this question in another context may find that this example can help clarify some of the issues--and one of those, most would agree, is the question of subtlety and/or indirection found in art and not propaganda.

*Is it only the method that distinguishes art from propaganda, or the substance of the knowledge claims?*

*Second, therefore, is art or propaganda more deeply rooted in truth? Does the orange dress better exemplify art or propaganda?*

## 5. Language and diversity in art forms

But, ah, some will be quick to point out when looking at "The Rape of the World", part of the contrast between a *direct* protest song and an *indirect*, purely visual protest is **language**. (Some will point out that language itself involves a *kind* of symbolism and itself is subject to ambiguity and indirection. However, most will concede that any art form that uses **language** can most easily make unambiguous and direct statements.)

The question of language--and lack of it in the case of the orange dress—can, therefore, be a good way of illuminating the ways the whole range of art forms communicate. *What, especially in their ability to make social protests, is illuminated about the ways in which art forms that don't use language nevertheless communicate? Dance? Instrumental music? Painting and sculpture? Applied arts (architecture, pottery, weaving) and so on?*

In fact, as the [TOK Course Book](#) asks, "To what extent do you think that some of the arts gain their communicative power by being free of language and its confines?" (p. 228)

The further fact that Kong Ning's orange dress isn't merely a kind of sculpture hanging in a gallery but, instead, being worn on city streets, raises an additional question about artistic forms: *how much should artists sincere about sharing knowledge work within traditional art forms, and how much should they be respected for inventing new forms--in this case a kind of "performance art"?*

Kong Ning's creation may well provoke some considered debate in considering the question in the *TOK Course Book*: "Can you think of new forms developed within the past century that have extended the outside boundary [between the "arts" and the non-art] as they joined the group already inside?" (p. 227),

## 6. Repression and satire

The discussion of indirection in artistic expression can give rise to yet another question in sharing knowledge. If an artist who states a protest directly or explicitly can be severely punished by the government, how much is the artist most effective when protesting indirectly or implicitly?

After all, there are clear cases involving Kong Ning's contemporaries who face imprisonment for being too blatant. (["Chinese artist who posted funny image of President Xi Jinping facing five years in prison as authorities crackdown on dissent in the arts."](#))

Indeed, aware of the concerns over punishment, one magazine article examining Kong Ning's protest uses as its title, ["Why China's artists are making waves and getting away with it."](#)

*ASIDE: In fact, this latter article provides some other examples of striking, shocking, ingenious, and provocative artists in China who, like Kong Ning, use indirection and symbolism to protest social issues. All could be used to raise most of the same knowledge questions already raised here.*

As the [TOK Course Book](#) points out, "As we consider how dictatorial regimes have imprisoned or executed artists...one thing is clear: it is not only critics of the arts who recognize that artists are making knowledge claims and passing judgments about the societies in which we live." (p. 240) How much should we expect an artist to challenge governmental policies when the result might be punishment?

## **7. The artist's intentions**

Consider this description of another art project in China designed as protest:

*One of Liu Bolin's most stunning scenes features the artist camouflaged within a photo of the *Intrepid*, a decommissioned American aircraft carrier docked in New York. The piece is an overt comment on the consequences of U.S.-style military dominance to which China aspires ([Macleans](#))*

"Overt"? Many would be inclined to stare with fascination at this photo in which the artist is barely visible because he has painted his own body to blend into the photo behind him of a huge aircraft carrier--and yet have no idea what the "meaning" of the painting is. As we saw, even the orange dress, comparatively explicit, may have no clear meaning to many.

Thus, we have yet another question about the way that art communicates shared knowledge: *if an artist's intentions are not obvious, can we say that the art's "meaning" can be independent of those intentions?*

## **8. Intentions and "reason"**

As the [TOK Course Book](#) points out, "In some popular stereotypes of the arts...one way of knowing is treated as though it were excluded: reason." (p. 229)

*How much and in what ways do the examples of artistic creation identified here (and in the article in Macleans) demonstrate the role of reason in planning and executing a piece of art--and understanding it? Could anyone claim that Liu Bolin or Kong Ning is simply producing art without using reason, entirely through the spontaneous expression of pure emotion or subconscious impulses?*

## **Further ideas for the classroom**

The topics and questions above provide a relatively straightforward way of handling this example of the orange dress, through raising for discussion a series of questions, or drawing the questions out of the ideas that student discussion is likely to raise in any case.

Alternatively, it could be stimulating to begin "backwards". In other words, students might engage most directly with the issues underlying the art of protest if they were first to design their own parallel project before looking at Kong Ning's protest. Thus, for example, they could be presented with an issue that matters to them, whether a broad social one such as religious/racial intolerance or a local/school based one. Then they could be asked to design a costume--with no signs/words--that could be worn to make their protest. They might, additionally, be asked to make their costume "artistic"--without going any further to explain the term.

An additional dimension would result if, working alone or in small groups, students then presented their costume (most easily done simply through description and/or a sketch) to the rest of the class without explaining the symbols (cultural or freshly created), their intentions, or the target of their protest. It would be up to the rest of the class to ask questions, of course, and compare the various results for ambiguity/clarity, likely impact, artistry/subtlety/propaganda and so on.

With their own attempts under their belts, students could well be in a heightened state of mind to turn their attention to the image of a woman dressed entirely in a long, trailing gown of...**orange cones!**

## References

Eileen Dombrowski, Lena Rotenberg, and Mimi Bick. *Theory of Knowledge*. Oxford University Press, 2013. <https://global.oup.com/education/product/9780199129737/?region=international>

Jamie Fullerton, "Chinese artist who posted funny image of President Xi Jinping facing five years in prison as authorities crackdown on dissent in the arts", *The Independent*, May 28, 2015. <http://www.independent.co.uk/news/world/asia/chinese-artist-who-posted-funny-image-of-president-xi-jinping-facing-five-years-in-prison-as-10282630.html>

Andrew Nunes, "How Artists Are Fighting Air Pollution in Beijing", *The Creators Project*, January 6, 2016. (includes images) <http://thecreatorsproject.vice.com/blog/artists-and-air-pollution-in-china>

Charlie Gillis, "Why China's artists are making waves and getting away with it," *Maclean's*, December 9, 2015. <http://www.macleans.ca/news/world/why-chinas-artists-are-making-waves-and-getting-away-with-it/>

Dan Levin, "Study Links Polluted Air in China to 1.6 Million Deaths a Year", *New York Times*, August 13, 2015. <http://www.nytimes.com/2015/08/14/world/asia/study-links-polluted-air-in-china-to-1-6-million-deaths-a-year.html? r=0>

Image courtesy of artist's Weibo



Feb 8, 2016

## Big lies, clever cons, and TOK ways of knowing, Part 1: Does it matter to tell the truth?



(by Eileen Dombrowski) Claiming he was a surgeon, Ferdinand Waldo Demara tricked the Canadian navy into giving him a ship full of people as his patients. With *no qualifications whatsoever* – without so much as high school graduation – he even performed operations on his trusting patients. How could anyone be so dishonest and callous as to deceive others so flagrantly? And why would so many people fall for his impersonation? The “con artist” – the swindler who plays a “confidence game” or gains the confidence of others for his own ends – seems to awaken our

emotional outrage, but also our fascination. Such reactions make stories of large scale deception enormously attractive for stimulating and focusing discussion in a Theory of Knowledge classroom.

I’m prompted to propose this topic for TOK by a new book on the “confidence game” and the numerous interviews and articles that the book’s publication has set off – easily accessible material for class on a topic that, in my opinion, is likely to captivate student interest. The book is [The Confidence Game: Why We Fall For It...Every Time](#) by Maria Konnikova. For an article by the author and several interviews on her central ideas (all available online), see my **Resources** list at the end of this post.

What knowledge questions come out of heartless manipulators taking advantage of our human inclination to trust others? Too many! Too, too many! I’m going to break the topic into separate parts that I’ll treat for the next four weeks. For each part I’ll make some suggestions for use in the classroom, in hopes, as always, of stimulating your own ideas:

1. Does it matter to tell the truth?
2. What does storytelling do to knowledge?
3. Is critical thinking utterly futile?
4. On guard against scams!

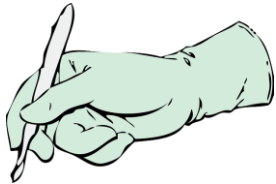
Today, I’ll offer a few ideas on dealing in class with the first of these topics.

## Sample stories

In a classroom, we benefit from harnessing the power of stories ourselves to catch student interest. I suggest opening by preparing stories of “cons” to share with students, to engage them and get them thinking, and to provide the group with shared points of reference for discussion ahead.

Myself, I’d choose three examples with different characteristics – different apparent motivations, different kinds of false identities, different kinds of audiences, and different consequences. I like the following, though you may want to select others from a sadly wide range of possibilities.

- Ferdinand Waldo Demara (1921 – 1982) : His impersonations were the basis of the movie *The Great Imposter*. He persuaded people to believe that he was many different identities, including a monk, a prison warden, and a doctor. He is the surgeon to whom I referred in my opening. Maria Konnikova picks him as the example that most piques her interest in [an interview in The Atlantic](#). His story is readily available online. Myself, I’d emphasize his impersonation of a doctor because the horrifying implications of believing his con are very evident.



- Samantha Lyndell Azzopardi (1988 - ) In 2013, a young Australian woman led international police forces to believe, for a time, that she was a vulnerable teenaged victim of human trafficking. When her “con” was discovered, she was found to be 25 years old, with more than 40 false identities in her past. Maria Konnikova gives Azzopardi’s story in an [article in The New Yorker](#).
- Bernie Madoff (1938 - ) This swindler did not take on a false name, but masqueraded convincingly as a trustworthy financial investor – so convincingly that he cheated clients out of \$65 billion. He was exposed in 2008 and in 2009 was sentenced to 150 years in prison. His story, readily available online, involves explaining a “Ponzi scheme” – Madoff’s being the largest Ponzi scheme in history. For a compact explanation, see an [article from the Business Insider](#).

The stories are worth preparing well for class – that is, planning your own narration, or handouts, or video clips – because they can act as vivid reference points for numerous knowledge questions they serve to raise and illustrate. It’s one of the sad truths of good classes, I find, that it takes *more preparation time* to deal with topics in *less class time* – to introduce ideas *briefly*. But the preparation time’s a good investment in this case.

## Telling the truth and ethics

In a course based on building knowledge as reliably as we can, the topic of lying is more than simply a Hot Issue in ethics. If learning to distinguish more effectively between what’s true and what’s false (with all the complexities!) is an aim of Theory of Knowledge, then a lively examination of outrageous

lies gives us a chance to validate what our course is all about! It also, clearly, leads directly into ethical discussion.

After introducing the stories of the con artists and their cons (or perhaps *while* doing so), I would ask a couple of utterly basic knowledge questions, open to a multitude of responses:

- Does it matter if what we believe is true? Why or why not?
- Is it morally wrong to lie? How do we know?

While it's entirely possible to have a good discussion on these questions in class when we ask them in the abstract, I do think that a discussion fueled by stories is likely to yield a wider range of ideas and a lot more energy and engagement. Note that a major resource for TOK teachers and students for dealing with such stories and debriefing them is my [Theory of Knowledge IB course book](#), Chapter 3 (*Seeking truth*) touches on the question "Does it matter if you believe it?" and Chapter 16 (*Ethics*) guides the debriefing of ethical case studies.

Likely to come up in class responses are ideas that can be debriefed into four major broad perspectives. These cluster ethical theories according to what criteria they use to measure right and wrong: the intentions and character of the *person who is lying*, the *lie itself judged by principles* or rules, the *consequences* of the lies.; and the *social context* within which truth or falsehood functions.

### **Did students bring up the *motives* of the con artists?**

The *intentions* of the deceivers – or their less conscious *motivations* -- seem especially fascinating for many people, given the wide popular circulation of the stories of deceivers.

Konnikova insists that there is no single profile of a con artist's motives – not even desire for attention, money, or power. In her interview with Julia Galef, though, she does comment on "[the dark triad](#)" of the con artist's psychology: psychopathy or lack of empathy; narcissism, combining an overblown ego and sense of entitlement; and Machiavellianism, or skill in manipulating others "to do your bidding for your own ends."

The example of con artists raises, more than many other examples do, the ancient *ethics of virtue*, based on stressing not particular actions but, more holistically, a person's *character*.

### **Did students bring up the absolute right or wrong of lying, judged by ethical *principles* of honesty?**

These examples of clever deceit do often cry out for firm condemnation – but on what grounds? Religious teaching -- and if so, grounded on what? Social expectations -- and if so, known how? Philosophical arguments for ethical principles put forth in deontology -- and if so, based on what? What are the roles of intuition and reason as ways of knowing?

### **Did students bring up the *consequences* of the lying on others?**

Did some of the cons seem harmless -- and if so, did they appear morally excusable? Which of the cons disturbed students the most – and why? Did they use arguments that you can debrief in terms of utilitarianism -- greatest benefit, or harm, for the greatest number of people? What are the roles of sense perception (observation), imagination, emotion, and reason as ways of knowing in predicting possible consequences and then evaluating them for their potential harm or benefit?

### **Did students bring up the moral code of the surrounding society?**

This example of deliberate cons is more useful in class than many other ethical examples we could use, in that it effectively stirs ethical issues that centre on the *social context*, such as those of loyalty to others (and the violation of betrayal!) and caring for others within a social network. What are the roles of emotion, intuition, imagination, and reason as ways of knowing?

If the stories of swindlers help you as the teacher to stir up student responses across a range of ethical perspectives, then they will have served their first purpose. It's up to you, then, to pose follow-up **knowledge questions** -- at least to plant them for later -- that help to characterize ethics as an area of knowledge:

### **Do theories in ethics – that is, broad and internally coherent perspectives on judging morality – contradict each other, or do they complement each other? In what regards do they tug in different directions for their arguments and conclusions, and to what extent do they provide different routes toward similar conclusions?**

Similar questions can be applied to the sciences, for example, or history, in order to open up comparisons of the roles of theories across knowledge. (But more on this next week.)

### **Conclusion: truth and trust**

The purpose of opening up ethical questions as the *first* discussion of a series on con artists is to establish *right from the beginning* that thinking about swindlers and their deceptions is worthwhile – not because they are worthy in themselves but because they challenge us to reflect on our basic assumptions regarding the value of truth for us as individuals and for our social cohesion. We are also affirming – or re-affirming, or re-re-re-re-affirming – the importance of looking critically at what we accept, and why, for the knowledge we build.

Interestingly, in spite of writing about deceivers, Maria Konnikova also comments on trust as giving individuals and societies an evolutionary advantage in giving supportive networks. In her interview with Julia Galef in a [Rationally Speaking podcast](#), she comments (starting at 40.57) : “We also know that being trusting comes with a lot of benefits, not just psychological. We know that on a social level societies with higher levels of generalized trust end up doing better economically. They have better social institutions. It makes so much sense, because we have to trust one another to be able to develop as a society. If everyone second-guessed every single person’s motive, we would not live in a very pleasant world.”

It might be well, for reasons that lie not within course objectives but kind teaching practice, to close a discussion on a deceptive world by returning students to affirming a sense of trust!

Next week I'll pick up another thread of knowledge questions raised by the stories of con artists – the power of narrative and the role of storytelling in knowledge.

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February 15, 2016

## Big lies, clever cons, and TOK ways of knowing, Part 2: What does storytelling do to knowledge?



(by Eileen Dombrowski) Stories have power. In the scams of con artists, they have the power to “get you emotionally transported enough that you stop asking questions, or at least the questions that matter.” So warns Maria Konnikova, whose recently published book *The Confidence Game* prompted my post last week, and this week. At the same time, however, stories have an enriching role in the creation of knowledge, not just in obvious areas such as literature and history but also in areas such as the sciences where we might not expect a narrative to carry us. What, then, is the role of storytelling in **telling lies**, and **telling truths**?

Today’s post is one in a four-part series on “Big lies, clever cons, and TOK ways of knowing”:

1. [Does it matter to tell the truth?](#) February 8, 2016.
2. What does storytelling do to knowledge? February 15, 2016.
3. Is critical thinking utterly futile? February 22, 2016.
4. On guard against scams! February 29, 2016. (That is, if you believe me that there is such a day this month!)

Yes, today I’d like to turn to a favourite topic of mine – **storytelling**. Like many other teachers, I’ve discovered the attention that lights student eyes when I tell a story in class – a case study, a story of discovery, a relevant plot summary. And, in personal terms, I confess that I abandoned this post mid-way in order to dash to the TV for this week’s episode of *Downton Abbey*. Stories can truly suck us in!

### The story and the con

Last week I suggested three stories of “cons” to engage students, prompt reflection, and provide points of reference for discussion of the knowledge questions that arise from the “confidence game” – the calculated deception practised by liars or swindlers to gain the trust of others for their own ends.

Maria Konnikova, in her account of con artists, emphasizes the way in which swindlers use their stories to draw in the people they aim to deceive: Ferdinand Waldo Demara told tales to convince others he

was a doctor (or a monk); Samantha Azzopardi concealed then disclosed what had (supposedly) happened to her to convince others that she was a vulnerable victim of human trafficking (and who would lie about *that?*); Bernie Madoff, through acting reliable and telling persuasive lies, lured the rich to invest their money in the largest Ponzi scheme in history. [As Konnikova says](#),

“Stories bring us together. We can talk about them and bond over them. They are shared knowledge, shared legend, and shared history; often, they shape our shared future. Stories are so natural that we don’t notice how much they permeate our lives....

“That’s precisely why they can be such a powerful tool of deception. When we’re immersed in a story, we let down our guard... In those moments of fully immersed attention, we may absorb things, under the radar, that would normally pass us by or put us on high alert. Later, we may find ourselves thinking that some idea or concept is coming from our own brilliant, fertile minds, when, in reality, it was planted there by the story we just heard or read.”

### Map knowledge and story knowledge

Clearly, the deception lies not in *storytelling itself* but in how it is used as a trap to catch us. Stories themselves, as Konnikova acknowledges, are a natural way for us to share our knowledge.

Indeed, the distinction has sometimes been made between “**map knowledge**” – knowledge of the *generalized overview*, frozen at a moment in time, such as our generalized scientific laws – and “**story knowledge**” – knowledge of specific situations presented through a *particularized narrative sequence*, such as case studies, historical accounts, or literature.

Konnikova notes a similar distinction between **propositional** and **narrative thought** as she [surveys the role of the story in compelling belief](#):

“In his book “Actual Minds, Possible Worlds,” Jerome Bruner, a central figure in the cognitive revolution in psychology, proposes that we can frame experience in two ways: propositional and narrative. Propositional thought hinges on logic and formality. Narrative thought is the reverse. It’s concrete, imagistic, personally convincing, and emotional. And it’s strong.

“In fact, Bruner argues, narrative thinking is responsible for far more than its logical, systematic counterpart. It’s the basis of myth and history, ritual and social relations. The philosopher Karl Popper “proposed that falsifiability is the cornerstone of the scientific method,” Bruner told the American Psychological Association at their annual meeting, in Toronto, in the summer of 1984. “But believability is the hallmark of the well-formed narrative.” Even scientists construct narratives. There is no scientific method without the narrative thread that holds the whole enterprise together. Stories make things more plausible, more convincing, and more fundable. Rightly or wrongly, a research proposal with a compelling narrative arc stands out. As the economist Robert Heilbroner once confided to Bruner, “When an economic theory fails to work easily, we begin telling stories about the Japanese imports.” When a fact is plausible, we still need to test it. When a story is plausible, we often assume it’s true.”

A story can be true, or a story can be false – but a well-told story can draw us in and persuade us. What is the role of a well-told tale, then, in areas of knowledge? What tests should we apply to a persuasive story, in our different areas, before we accept it?

### **Classroom discussion: ways of knowing, areas of knowledge**

I'll now offer some classroom suggestions – as always, simply to stir ideas of your own for how you would *do it yourself!* If you have any thoughts to share, I'd welcome your commenting at the end of this post.

First, to open discussion, ask students some *knowledge questions* that hark back to the “con” stories and some of the previous discussion (my post last week). Pull their ideas back into memory!:

What **ways of knowing** are involved in our being drawn into a story and believing it? What are the roles of intuition in swiftly connecting incidents and imagination in filling in the details? How does emotion work in our engagement? What about faith, in the sense of *trusting* the storyteller – or, more broadly, your source of information? What about memory? sense perception? reasoning? Is language the most important way of knowing for storytelling, or does its effect depend on other ways of knowing?



Then, I suggest opening discussion of storytelling in areas of knowledge by starting with **Indigenous Knowledge**. Shift *away* from stories as part of a “con” – and *toward* stories as a serious means of understanding and communicating. If students don't have much familiarity with indigenous storytelling themselves, fill in some background yourself – at least enough to establish *stories* as significant in binding together elements of an entire worldview and *storytelling* as an important way of passing on knowledge of the world. A compact summary such as this one hits many points briefly: [“Many Voices”](#) A short video such as this one from youtube could also be helpful in class: kenquiethawk, [“The Oral Tradition of Storytelling”](#)

Then break knowledge, treated holistically in indigenous traditions, into specialized areas. Break the class into smaller groups to consider them: groups on each of literature, history, and the natural sciences. Provide each group with discussion questions and a time frame – and the expectation that they bring their main ideas back to share with the group as a whole. Sample discussion questions:



### Literature and film:

- Is it important for a story in a literature or film to be *believable* – even if it is fiction or even fantasy? *How* does an author make a story credible? What is the difference between “believing” a story in literature and “believing” a story in history or the sciences?
- What besides entertainment does the story enable an author to achieve in a literary work or film? Can a fictional story convey truths?
- What tests does a story have to pass in order to be accepted as “literature”?
- What arts other than literature and film also use storytelling as part of their content and part their method?
- *Select an example from literature class to use as an example to illustrate your main points as you bring them back to the class.*

### History:

- To what extent does the historian draw upon people’s stories from the past as *resources* for his or her own work? Where does the historian find these stories, and how does he or she use them?
- To what extent is the historian a storyteller? Is narration an essential part of historical explanation?
- Have you noticed any examples of historians influenced in their own narrative accounts by larger narrative perspectives given by their own societies?
- What makes one historical narration more convincing than another? What tests does a story of the past have to pass in order to be accepted as “history”?
- *Select an example from history class to use as an example to illustrate your main points as you bring them back to the class.*

### Natural sciences:

- To understand science, is it important to be aware of the stories of scientists in the process of *creating* knowledge?
- Nobel prize-winning biologist [Peter Medawar has said](#), “Scientists are building explanatory structures, telling stories which are scrupulously tested to see if they are stories about real life.” In Medawar’s description, what would be the role of hypotheses, models, and theories in scientific storytelling?
- What makes the “story” told by a group of scientific researchers *believable* to the scientific peers who evaluate it? What tests does it have to pass in order to be accepted as “science”?
- *Select an example from science class to use as an example to illustrate your main points as you bring them back to the class.*

As the small groups return to the larger class to present and exchange ideas, encourage students to compare the areas of knowledge in terms of each other’s questions. NB: Useful on the **natural sciences** might be the following resources – probably most useful just for you to read in advance yourself to have some of the points in mind for questions you might pose, or passages you might quote, in class discussion:

- ["The Tensions of Scientific Storytelling"](#)
- [The Story Behind the Science: Bring science and scientists to life.](#)
- ["And, But, Therefore' Randy Olson and the art of Scientific Storytelling, Part 3"](#)

It would certainly also be possible to frame knowledge questions on the role of narration for ethics (as in last week's post), human sciences, and religious knowledge.

### Broader knowledge questions

Last, while the class as a whole still has indigenous knowledge, literature, history, and the natural sciences freshly in mind, close with some *very broad knowledge questions*, in order to leave students thinking about the role of narration as it runs through knowledge:

**How much do stories stand on their own, and how much do they depend on *other stories*? Do they gain their believability and impact from being connected with others – either by being compatible with them or by contradicting them?**

**What follows from our believing a story? How does it affect how we think, what choices we make, and how we act?**

The last question above is certainly one to which you and your students will surely find reason to return again and again in your TOK discussions of knowledge.

**PS.** Feb. 19. Further to these last knowledge questions, I think you'd really enjoy a podcast on the use of stories in marketing, with comments from adman Terry O'Reilly: "[What Happens in Vegas Stays in Vegas](#)". He gives some splendid examples of tourism marketing campaigns, and concludes by emphasizing the way that the storytelling element caught public attention and made the campaigns successful. Stories catch us -- and yes, they influence our choices!

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Feb 22, 2016

## Big lies, clever cons, and TOK ways of knowing, Part 3: Is critical thinking utterly futile?



(by Eileen Dombrowski) Does *everyone* really fall for con artists? *Everyone, always?* That's the subtitle of Maria Konnikova's book: *The Confidence Game: Why We Fall For It...Every Time*. No, I'm *not* going to fall for taking a catchy title literally! But if potential victims are so very vulnerable, is it utterly futile to try to develop skills of critical thinking in our own defense?

This post is the third in a series on the deceptions of "the confidence game":

1. [Does it matter to tell the truth?](#) (ethical perspectives on telling the truth) February 8, 2016.
2. [What does storytelling do to knowledge?](#) February 15, 2016.
3. Is critical thinking utterly futile? February 22, 2016.
4. On guard against scams! February 29, 2016.

This week, I'd like to look more closely not at the perpetrators of scams and frauds, but at the *victims*. Interesting though con artists may be to many people ("How do they do it?"), the victims may be even more fascinating ("Why did they fall for it?") – especially if even smart, experienced people are vulnerable. Konnikova assures us that even con artists can be conned!

I'd also like to look more closely at what we mean by "thinking critically", and the several TOK ways of knowing that have to be involved.

### **What ways of knowing do we need for thinking critically?**

Too often, people associate thinking clearly and critically only with *reasoning*, as if it operates on its own without its constant companions – such as *intuitive connecting, feeling, imagining, and remembering*. Thinking clearly, however, demands self-awareness that goes beyond reasoning alone – and we need to be attuned to all of our TOK ways of knowing as we attempt to deal with attempts to persuade us. After all, knowledge claims come at us from all sides,

often embedded in tactics to capture our belief. So how can we think clearly, with awareness of persuasion, as we filter the claims on our belief?

Maria Konnikova, based on her extensive investigation of con artists, insists that we have to lay aside any notion that we can't be fooled ourselves, that we've somehow immune. We should never assume, either, that we can immediately recognize a fraud or see it coming. Indeed, human beings in general are not at all good at detecting lying, especially when the liars are so untroubled by lying that they exhibit none of the signals we might expect.

I thought of her comments last week when I had coffee with a friend who is a retired police officer. "Scams!" he exclaimed, when we got onto the topic. "You wouldn't believe how easily police officers, even experienced ones, fall for scams – if they've been given a tip by another officer." He described an investment scheme through a bank in the Caribbean, which promised excellent returns. "One of the guys was retiring and invested his entire severance pay in the scheme. It turned out that the bank didn't even exist. And you know what his job was? He was a fraud investigator!"

**Thinking critically, it seems to me, demands facing up to our own fallibility, and preparing ourselves to filter knowledge claims with greater self-knowledge. We need to apply *both* self-awareness *and* reasoning.**

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## CLASS ACTIVITY

But how do we bring these ideas into our TOK classes to engage our students? If they have been dealing already with ideas of ethics, truth telling and deception, and with the ways of knowing involved in storytelling – as in my previous two posts with their discussion activities – they may already have raised the questions and ideas I propose ahead. If so, ignore this activity and move on. If not, though, you may want to give them a nudge – not necessarily to build a full class around this activity, but to use it to pull together ideas still floating and insufficiently processed.

What I suggest today is totally straightforward:

- give students the three passages I excerpt below to stimulate their thinking,
- give them the discussion questions to think about while reading, so that they formulate their thoughts in preparation for discussing them together
- and then, in class discussion, encourage students to articulate their thoughts on being aware of various TOK ways of knowing, not just reason, in trying to evaluate knowledge claims we are given in the real world.

## Questions for discussion

In the three passages you have read, what are the roles of the following TOK ways of knowing:

- **TOK way of knowing, faith.** One of the definitions of faith is a trust we place in others or in particular sources of knowledge. Trust in each other is fundamental to being able to work together in a society and create happier lives. But what do we have to be aware of as we place our faith in others? What are the characteristics of a source of information that is unreliable? What are the characteristics of a source of information that is reliable?
- **TOK way of knowing, emotion.** In what ways is an understanding of our own emotions important for clear and critical thinking? If emotional vulnerability makes us more likely to be fooled, does emotional stability make us completely safe? Does emotion simply get in the way of critical thinking, or can it act truly as a “way of knowing” and help us reach more reliable conclusions?
- **TOK ways of knowing, intuition and reasoning.** Why is it important to distinguish between the fast judgments of intuition and the slower judgments of reasoning? Would it be fair to say that reason is essential to being able to reach sound conclusions? In real life, does reason act alone?
- **self-knowledge:** What is the role of knowing ourselves in trying to know about other people and the world?

### Passage 1: moments of vulnerability

from Olga Khazan, [“Can you Spot a Liar?”](#) (interview with Maria Konnikova), *The Atlantic*, January 12, 2016.

Khazan: Why are we more likely to fall for cons when we’re feeling isolated and lonely?

Konnikova: Emotional vulnerability is one of the things that unites victims of cons, in the sense that it’s not so much a personality trait, as where you are in your life. Because what happens when you’re down, when you’re vulnerable, there’s change going on, and your world no longer makes sense the way that it used to, so you’re particularly vulnerable to people who make sense of it for you. You want that meaning. You want that sense of connection and con artists are very happy to supply it for you. One of the things that I found really interesting is that it transfers across domains. So, for instance, if you lose your job, you’re not just more vulnerable to finance frauds, you’re more vulnerable to romance frauds, you’re more vulnerable to every single thing even if it has nothing to do with money, just because you’re in an emotionally susceptible position.

### Passage 2: misplaced trust

from John Wasik, [“Inside the Mind of Madoff: When Did Scam Really Begin?”](#), *Forbes*. October 3, 2012.

“Why did Madoff get away with his scam for decades? His false success fed on itself. Investors who claimed he was achieving new heights in finance told others. His referrals were legion: Foundations, banks, other brokers. In truth, he was a legend in his own mind...”

“What can we learn from the time when Madoff — and now allegedly his associates — perpetrated this crime?”

"We know that con artists often have a religious zeal and charisma that makes us suspend disbelief. It's like we are interacting with movie icons in the flesh. We believe that they can do heroic things, so we hand over our money and repress our doubts.

"And if we do have reservations, we can engage in denial for decades. They are like cult leaders or politicians. First, they gain our trust and confidence, then we just disengage our critical thinking skills. When that happens time — and reason — stand still while we lose our shirts."

### Passage 3: self-deception

from Olga Khazan, "[Can you Spot a Liar?](#)" (interview with Maria Konnikova), *The Atlantic*, January 12, 2016.

"Khazan: One thing I found surprising was that cons are underreported. Why is that?

"Konnikova: Part of it is that people really value their reputations, so they don't want others to know that they fell victim. The other thing is that they value their reputation so much is that they don't want *themselves* to know. They would much rather believe that they were the victims of bad luck than that they were victims of a con artist. Our self-deception is incredibly powerful, because we have this very strong protective mechanism where we want to think of ourselves in the best possible light. No one wants to think of themselves as a sucker or as someone who falls for some con artist, who to someone else might seem obvious.

"You want to think of yourself as someone who's smart, as someone who's savvy, as someone who would know better, and so that's exactly what you do, you say, 'Oh, bad luck, luck of the draw, it was just a bad investment decision or this person just wasn't ready for a serious relationship,' whatever it is. So the funny thing is, most people don't learn from their mistakes because they don't acknowledge that they made them."

### Conclusion

Through the activity above, I hope that students will put into their own words, for themselves, some sense that *self-awareness* and *self-knowledge* are extremely important in being able to evaluate what knowledge claims are believable. I would hope, too, that they will recognize that what we identify as "TOK ways of knowing" work together and influence each other as we attempt to filter knowledge claims most reliably.

Next week, in my fourth and final post in this series on scams and the confidence game, I'll apply the ideas raised so far to actual scams students may encounter.

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February 29, 2016

## Big lies, clever cons, and TOK ways of knowing, Part 4: On guard against scams!



(by Eileen Dombrowski) Word of the day: *gullible*. Definition: easily duped or cheated, quick to believe something that is not true. In this last of four posts on scams and the “confidence game”, I’d like to close with activities and discussion for students aimed at reducing their *gullibility* and augmenting (I hope) their skills of critical thinking.

The four posts have all been prompted by Maria Konnikova’s recent book: *The Confidence Game: Why We Fall For It...Every Time*.

1. [Does it matter to tell the truth?](#) (ethical perspectives on telling the truth) February 8, 2016.
2. [What does storytelling do to knowledge?](#) February 15, 2016.
3. [Is critical thinking utterly futile?](#) February 22, 2016.
4. On guard against scams! February 29, 2016.

In last week’s post, I argued that “thinking critically” necessitates not only logical reasoning but also emotional self-awareness. I passed on, in summary, two pieces of advice from Maria Konnikova, based on her research:

1. Never assume that you’re not vulnerable yourself or that you will always recognize a scam.
2. Recognize your own increased vulnerability to being manipulated and deceived at moments of emotional stress, even if that stress is simply a change of job or a move.

Even though the subtitle of Konnikova’s book declares that we always fall for scams, clearly she doesn’t believe we all do, all the time. And neither do I. Thinking critically is NOT futile!

## Scams and knowledge questions

This week, I suggest setting your students to work to examine current real life scams -- and to build *their own list of tips* for being on guard against being deceived. Have them look at devious and nasty scams to catch their interest and indignation, and have them think about general defenses against cons.

Close-up, the knowledge question they'll pursue applies critical and analytical skills:

***How can we tell when a source or a knowledge claim is NOT to be trusted?***

Stepping a bit further back, the more general knowledge question is an essential one for students, both for everyday evaluations and for doing research for their Extended Essays or future university courses:

***How do we know when a source of knowledge claims is reliable?***

### Class activity

In earlier posts in this series on scams, I've suggested some general class discussions and some small group work. This time, why not have students work in pairs? Assign each pair a scam to work on. Goal: to be able to give a short account to the rest of the class, and answer these questions:

- What tactics are being used in this scam, and for what purpose?
- Why do you think someone would fall for this scam?
- What advice would you give people to recognize and resist this scam?

The pair preparation can be in class time if your students have internet access from the classroom, or on their own time if they can work together outside of class (face to face, or online).

From lists readily available on the web, I'd select ones relevant to students and then give them some choice of which to investigate further. Some such sites:

- ["Top 10 List of Scams of 2016"](#), Consumer Fraud Reporting
- ["Common Scams and Frauds"](#), USA.gov
- ["27 common scams to avoid"](#), The Guardian

Some of the most common that students are likely to encounter include online dating scams, the "Nigerian scam" (419), and phishing emails.

Among the most important to treat, I'd say, are ones that plunder information from users of Facebook and other social media sites. Ex-conman Frank Abagnale, now an FBI security expert, warns that children and young people are vulnerable to revealing too much information on social networking sites. (["Facebook users risk identity theft, says famous ex-conman"](#)) Discussion of online privacy and secure sites is extremely relevant to our students, and demands that they think about *knowledge*, and

what power knowledge of themselves might have in the wrong hands. Ownership and control of knowledge are perpetual topics in Theory of Knowledge!

### **Drawing conclusions**

As pairs present the particular scams they've investigated, you can help your class build a collective list of advice on how to be on guard against scams. Not only have you encouraged them to be analytical about knowledge claims and their sources, but you probably now find yourself distilling tips that can be linked, at some point, to critical methods of different disciplines.

Finally, end with the knowledge question not in the negative but the positive, treated as an ongoing question of the course: ***How do we know when a source of knowledge claims is reliable?*** You've thereby hooked the whole of your class discussions of scams and the con game – not just in today's suggested class but in the earlier ones – back onto one of big pegs on which the whole course hangs.

Or...maybe not. One thing we learn from studying the "confidence game" is that when something sounds too good to be true, then...it probably is.

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March 15, 2016

## Perspectives and manipulation: Six photographers and a single subject



<http://www.shutterbug.com/content/lab-pushes-boundaries-photography-decoy#4POmbuChWLvkkDcq.97>

(by Eileen Dombrowski) At first glance, this three-minute video ([6 Photographers Capture Same Person But Results Vary Widely Because of a Twist](#)) provides a visually engaging, if rather obvious, illustration of differing perspectives at work as 6 photographers take distinctly unlike pictures of the same subject. Taken at face value, it's an appealing resource for a TOK class on the effect of what we think (*perspectives, WOK intuition/reason*) on what we see (*WOK sense perception*) and how we represent the world (*WOK language*). It's when we question the methods of the film makers, though, and the reach of their conclusions, that the video becomes richer in questions that we want to raise in Theory of Knowledge.

The Australian video, sponsored by the photographic supply company Canon, ends with the conclusion printed up on the screen: **"A photograph is shaped more by the person behind the camera than by what is in front of it."** In many a TOK class, all that would be necessary to start an appropriate discussion would be the simple questions, **"Do the film makers support this claim effectively? How might you re-phrase what you think they demonstrate?"**

It's possible, though, that students might accept the overstated and relativist conclusion so completely that they recognize none of the flaws in the method of reaching it. I think it's fair to say that people tend to be less critical of "evidence" that supports their own views than "evidence" that contradicts it. Trying to be *open-minded* – resisting our human inclination toward confirmation bias (*WOK intuition*) – and strikes me as one of the most ambitious goals of the IB learner profile!

To stir response, then, I'd appeal to students' sense of fairness (*and some discussions of AOK ethics*) and ask, **"Do you think it was right for the film makers to lie to the six photographers about the person they were asked to photograph?"**

To stimulate or supplement student response, you might find interesting the comments on this video from numerous other photographers, posted on the website of *Shutterbug*: [6 Photographers Capture Same Person But Results Vary Widely Because of a Twist \(VIDEO\)](#). They voice their views on dishonesty and manipulation, and they provide some counterbalance to the leaning toward photographer subjectivity in the video's conclusion. Some comments selected from this site:

### Some comments from photographers

- This video doesn't prove that the photographer's point of view shapes the portrait taken since there was in fact a different character in front of each photographer. Any decent portrait photographer will try to get the personality of their subject to show in the photo. To do this you need to know some things about the subject. They got most of this from the introduction and from the actor's feedback as they were shooting.
- I can't agree with the tag line that the photographer shapes more of the image than what's in front of his lens. A portrait is a collaboration, not a one way street and I dislike that this is the message being shared.
- To see each photographer's interpretation - each needed to photograph the same subject with the same information.
- Are we talking about a portrait as a service for the person photographed? Which of course must take into account the expectations of the client. We hear one of the photographers ask "What do you want the photo to say about you?" Now that is by definition a service oriented question.
- So they asked an actor to play 6 different roles. Obviously he did well - but it proves nothing regarding the photographers... These were photographers...and their job is to learn about their subject and show who he is, not just his appearance. I'd say the actor played his roles well, and the photographers did well helping him to flesh out those roles. If I was one of the photographers, I'd feel a little used - like somebody played "gotcha!" with me.
- **There's no "Control" on this experiment. Also, a photographer brings their own style in the first place. PLUS, if you tell a photographer something, it's SUPPOSED to influence the shoot. I HATE when "experiments" like this try to convey something that's assumed by the experimenter. That is, "Experiments" with an agenda.**
- These photographers were set up and made to look foolish, manipulative, and incompetent. They were told to make a "revealing" portrait. And then they were misinformed by the agent, and the subject, who pretended to be something he wasn't. It makes what we do seem superficial and manipulative... I have, for many years, described portraits as collaborations. It's incumbent on a portraitist to know their subject to some degree, or when time is short, to accept their external signifiers as the clues they usually are... (the clothes we choose to wear, the style of hair, jewelry, posture, speech patterns). But when someone deliberately obscures who they are, and strips all genuine manifestations of themselves away, presenting nothing but

trickery and deception, all we can do is create a fiction. If you want a genuine representation of who you are, you must be willing to reveal some of that to a portraitist... or be satisfied with an irrelevant, and in this case, dishonest representation of no one.

It seems to me that by trying so hard to make their point, the film makers actually weakened it. If they were sincerely convinced that different photographers would create different images of the same thing, why did they need to introduce the fictional biographies? And did they not thereby change the subject itself, so that the six were no longer taking pictures of "the same person"? Moreover, weren't the six being given certain expectations for what kind of photograph they were being commissioned to do? I've been trying to pin down the nature of the promotion that Canon is doing in a video that is indirectly an advertisement – and I'm thinking about messages regarding *buying* creativity or power.

I'd end, then, with posing questions about subjectivity and objectivity, and comparing expectations we have about the creative arts and the human sciences in how they treat human beings.

**Questions about photography:** Is there anything very wrong – or is there anything very right - with photographers taking extremely different images of the same thing?

**Questions about the film makers' methods:** Would this trial involving 6 photographers qualify as an experiment within the human sciences, with a hypothesis, control of variables, careful and repeated observation, and conclusions proportionate to the data?

## Conclusion

As you can probably tell from my comments and questions on this video, I find it both catchy and annoying. It's engaging in its visuals and storytelling, and it does make strongly a point relevant to TOK. But at the same time, it's sloppy in its thinking and flawed in its methods. But this is exactly the sort of material I seek out for class. Flawless materials leave nothing for students to add, whereas flawed but interesting ones can provoke engaged critique.

Finally, I confess that the video's conclusion really bothers me personally – almost frightens me, if it's left unchallenged. When I yield to my inclination to see metaphorically, I find too many disturbing echoes around me in the media. Do we accept being lied to? Do we think that the lies we carry in our heads are more significant than what is actually the case in the world we witness? And then what kinds of representations do we accept or create of refugees, minority groups, women, Muslims, Christians, environmentalists, patriots? Doesn't it matter?

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March 21, 2016

## Conspiracy theories, intuitions and critical thinking: Part 1



(by Theo Dombrowski) *Did you know that* the Charlie Hebdo attack was not, as the media tell us, an attack by terrorists offended by the satiric magazines' portrayal of Muhammed, the Prophet? Did you know, rather, that it was orchestrated by the U.S. in order to punish France for its foreign policy decisions? *Did you know that* pop star Kate Perry is, in fact, a member of the Illuminati, bent on world domination? Both of these are carefully hidden facts, of course. And if you need any proof of the effectiveness of the *cover-up* of either and, therefore, the terrible power wielded by those running the world, what better proof than **the fact that you cannot find a single shred of evidence for either claim?** These are but two of literally hundreds of "conspiracy theories" reported in many media, but most widely on the internet.

A series of recent TOK blog posts examined, through the scrutinizing eyes of TOK, the nature of public "cons"-- deliberate schemes to dupe the public, mostly but not always for profit and power. Here, with conspiracy theories, we look at a different kind of public deception, usually driven by entirely different forces. In fact, the irony is that most conspiracy theorists have exactly the opposite motives of con artists--not to **deceive** the public, but, rather, to **inform** them of the truth, hidden, in most cases, they assert, by powerful forces--of governments, of corporations, or of secret societies. Thus, when we consider the nature of **shared knowledge** conspiracy theories provide a provocative example of issues involved in the nature of publically shared "knowledge".

Generally, conspiracy theories are dismissed as laughable, absurd, or just exasperating. However, the urgency underlying the need for clear-sighted weighing of evidence surrounding conspiracy theories is evident in many contemporary crises. Conspiracy theories can be truly damaging.



Take, for example, the case of the Zika virus. According to [an article in \*The New Yorker\*](#), the internet is alive with conspiracy theorists claiming that "genetically modified mosquitoes cause the spread of Zika. This is a particularly dangerous misapprehension, because, for now, controlling mosquitoes may be the only way we can hope to control Zika." (The absurdity of this conspiracy theory is exposed both in this article, and more fully at: "[Why the Zika conspiracy theories don't hold up](#)")

### **How to respond to conspiracy theories**

Even without any other tools than those provided by TOK, we can aim to expose the shaky (or non-existent) foundations of many conspiracy theories. It wouldn't take a class long to invoke such fundamental TOK analysis as the "truth checks"(c.f. *Course Book*, chapter 3) to expose the dubious viability of many a claim about conspiracies afoot in our midst.

Unfortunately, many claims could equally expose some of the limitations of the truth checks. After all, if stories of conspiracies do fit readily with what one believes already, then what good is the coherence test as a quick response to raise doubt and provoke further questions? Without abandoning the truth checks and application of them using reason, we do have to go beyond them into understanding how we form our beliefs -- often intuitively.

A recent book provides an excellent framework for complementing rational analysis with the findings of research in cognition. In *Suspicious Minds: Why We Believe Conspiracy Theories*, Rob Brotherton, takes the opposite approach of many who expose conspiracy theories. Rather than emphasizing the marginal--even paranoid or deranged--minds of most conspiracists, Brotherton argues that it is *the fundamental nature of the human mind* that makes everyone susceptible to believing that "big pharma" is hiding a cure for cancer, for example, or that climate science is concocted by academics who want to line their own bankbooks. Or that Kate Perry is a not just a member of the illuminati but a robot. Seriously.

Understanding this susceptibility to conspiracy theories thus becomes, through Brotherton's analysis, a way of understanding many fundamental facts of the way all humans process experience in order to develop *belief*: "...we're looking at the way of all of our brains work not just the brains of conspiracy theorists".



- Brotherton's arguments are explained not just in his book, but, up to a point, in his article [“The logic behind conspiracy theories”](#).
- More extensive and analytically accessible, however, is an interview in the [podcast All In the Mind](#) with host Lynne Malcolm.

## Intuition as a way of knowing: cognitive biases, heuristics

### Some Cognitive Biases

1. need for control
2. pattern finding
3. intentionality bias
4. proportionality bias
5. perceived risk
6. confirmation bias

So what, then, do we learn from Brotherton about cognitive biases and heuristics, which we treat in TOK most obviously in connection with *intuition as a way of knowing*? (See chapter 12, *TOK Course Book*) Crucial to all of these automatic leaps of mind is not just that they help explain why conspiracy theories can seem reasonable, even compelling to those who accept them, but also that they explain why we all are tempted to believe many things *without* easily filtering out the absurd with truth checks and rational analysis.

### 1. Need for control

When we feel our sense of control is stripped away for whatever reason "then we look around for other sources of control, what's called compensatory control...." The result? We are more likely than we would normally be to believe that large forces are at work, controlling our lives.

### 2. Pattern finding

As Brotherton observes, "...finding patterns is an ability that we rely on every moment of the day....it's one of the brain's most remarkable abilities and it underlies all kinds of human endeavours." What then is the problem? Well, as has been pointed out in other posts (e.g. ["Pareidolia in Your Pocket"](#)), the almost reflexive detection of patterns can be a distortion of reality. What seems to be a pattern of evidence of cause and effect, of links, and so on, can be little more than ingenious "cherry picking" -- selecting the cherries (or bits of evidence) that suit the purpose.

### 3. Intentionality bias

Particularly strong in children, apparently, the deep-seated sense that someone or some force is at work rarely leaves us completely, says Brotherton: "our brain is...whispering in the back of our head that everything about this [that is, event or phenomenon] was intended. Somebody meant this to happen." If this bias is in play we can easily see how tempting it is to search around with our conscious minds to find "evidence" that a hidden or secret force is at work.

#### 4. Proportionality bias

If we observe a comparatively inconsequential event, we may well not even think about causes. Not so, however, if a president is assassinated or disease suddenly strikes a whole population. In the words of Lynn Malcolm in her interview with Brotherton, " We find it difficult to accept that a relatively small event can have disproportionately huge ramifications." If we can't see a proportionally large cause of a large event, how tempting it is to assume that such a cause must be...hidden.

#### 5. Perceived risk

Why are conspiracy theories rather than scientific evidence still commonly accepted in such cases as climate change or vaccination safety in relation to autism--even where the science is overwhelming? Brotherton explains, "Psychologically we evaluate risks depending on whether it's something we're *actively doing* or whether it's something we're *not doing*." That is, our minds make us *feel*, irrationally, that doing nothing is inherently safer than acting to prevent danger.

#### 6. Confirmation bias

Much of the impelling force behind teaching TOK is the hope that clear thinking about both WOKs and AOKs will help us assess *degree* of certainty, rather than (necessarily) fully accepting or fully rejecting claims. The studies that Rob Brotherton reports, however, suggest that most people don't come naturally to such level-minded assessment, particularly when conspiracy theories are involved: "we surround ourselves with people and information that pretty much aligns with what we already believe."

What about the role of real, attested evidence in challenging conspiracy theories, though? The news is not reassuring. Brotherton reports a study involving two groups of people, those who accepted a conspiracy theory and those who rejected it. Both were given a packet of information. Half of the information supported the theory and half undermined the theory. The result? We would expect both groups to soften their position, at least a little, in the light of the new information. Instead, however, both groups **strengthened** their original position!

(One possibility that Brotherton doesn't discuss, but which we examined in a previous blog post, is that people tend to **assert** increased conviction, even **act** upon their beliefs when they are made to feel shaky about the truth of those beliefs.)

"Why is it so difficult for us to change our minds?" asks Lynn Malcolm. Rob Brotherton's answer points to the evolutionary rationale of this rigidity of mind: "it seems to be hard-wired...this is how we've evolved to think... it makes sense to be skeptical of claims that go against what we already believe." Needless to say, though, Brotherton goes on to say, "...this can result in a self-insulating feedback loop...it's very rare that people actually change their minds."

### Hope for critical thinking

In an [article on conspiracy theories](#) in *The Guardian*, journalist David Shariatmadari reports the work of Viren Swami, a professor of social psychology: "Swami found that people who had been encouraged to think analytically during a verbal task were less likely to accept conspiracy theories afterwards. For him, this hints at an important potential role for education. 'The best way is, at a societal level, to promote analytical thinking, to teach critical thinking skills.'"

Thus, while changing entrenched beliefs may be difficult, it seems that the kind of critical thinking that underlies TOK can prevent such ill-founded beliefs forming in the first place.

### Preventing conspiracy theories

But do we want to discourage belief in all conspiracies? Anyone with a cursory knowledge of history or contemporary events will be quick to point out that there actually have been some powerful and dangerous conspiracies. Bizarre as it sounds, for example, the CIA really did (as they admitted) [perform mind-control experiments](#) on civilians using drugs, electronics, and hypnosis. Less sensationally, we're all familiar with many corporation, pharmaceutical company or government cover-ups.

As Rob Brotherton emphasizes in his [article in the LA Times](#), "Dismissing all conspiracy theories (and theorists) as crazy is just as intellectually lazy as credulously accepting every wild allegation. The tricky part is figuring out what's reasonable and what's ridiculous, and we can do that only by honestly scrutinizing why we believe what we believe."

And doesn't this assertion come close to summing up one of the major principles underlying TOK? Is his point worth repeating--this time in bold? Yes!

**The tricky part is figuring out what's reasonable and what's ridiculous, and we can do that only by honestly scrutinizing why we believe what we believe.**

In next week's post, we will suggest some class activities, with examples, on recognizing conspiracy theories and the cognitive biases involved.

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April 1, 2016 (April Fool's Day)

## Mathematicians protest to free "highly calculating" teacher



(by Eileen Dombrowski) Sets of prominent mathematicians rallied today to demand the release of an imprisoned mathematics teacher on the anniversary of his arrest. Ten years ago, he was apprehended boarding an international flight while in possession of a ruler, protractor, setsquare, and calculator. He is being held in Geometer's Bay, charged with transporting weapons of math instruction.

A spokesman for Heavily Organized Armed Security (HOAX) declared that the man is dangerous. "He belongs to a cult that derives its teaching from a code known as the Axioms. These people are highly calculating." It has been rumoured that the detainee is a member of the powerful group Al-Gebra, who follow their Ruler, reputed to be a straightforward hardliner. A dogmatist, he asserts that just two points are enough to determine his unique party line.

"Al-Gebra is a notorious cult," insists the security spokesman. "They desire average solutions by means and extremes, and sometimes go off on tangents in search of absolute values. They use secret code names like 'x' and 'y' and refer to themselves as 'unknowns,' but we have determined that they belong to a common denominator of the axis of medi-eval, with co-ordinates in every country. They test the limits."

At today's rally, the leader sined and hundreds of others cosined a petition for the teacher's release, insisting on the importance of proof.

Current political candidate Dawn Trumpet commented dismissively on the protest. "If God had wanted us to have better weapons of math instruction, he would have given us more fingers and toes."

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**Happy April Fool's Day!**

Eileen Dombrowski. Theory of Knowledge Blog, Oxford Education Blog, 2016.

April 4, 2016

## Conspiracy theories, intuitions and critical thinking: Part 2

### Some Cognitive Biases

1. need for control
2. pattern finding
3. intentionality bias
4. proportionality bias
5. perceived risk
6. confirmation bias

(by Theo Dombrowski) Our intuitions can take us in leaps to some crazy places. And yet, if we're going to consider how we *really* build what we *claim* is knowledge – in real life rather than in some tidied and rational abstraction – we do have to look at some of those crazy places and the pre-rational cognitive biases that take us there.

My last post dealt with conspiracy theories as a significant but frequently entertaining entry point for recognizing some of the flaws of intuition as a way of knowing – that is, if it is not supplemented by awareness and the more rational processes of critical thinking. This week's post picks up that background and applies it in a series of classroom exercises to get students to engage their minds. After all, we can't teach critical thinking by *telling* students about it. They have to *do it* themselves.

**Below are some exercises that you are free to use or adapt to your own classroom context.**

### Common cognitive biases

First, referring back to [Conspiracy theories, intuitions and critical thinking: Part 1](#) it would be a good idea to review cognitive biases that Rob Brotherton argues to be common to all humans:

1. The need for control
2. Pattern finding
3. Intentionality Bias
4. Proportionality Bias
5. Perceived Risk
6. Confirmation Bias

For the first exercise below, it could provoke thoughtful discussion to look at some social forces and historical movements that could well provoke conspiracy theories--in order to look at the seeds of such distortions of evidence.

### Exercise 1: Invent your own conspiracy

**INSTRUCTIONS:** Invent conspiracy theories to go with the following and say which cognitive bias, or biases they arise from. (This could be done individually, in pairs, or in a whole group discussion)

1. Within the last few years, the crime rate has risen in your county, the jobless rate has skyrocketed, and everywhere there is civil unrest. Can you invent a truly devious, ingenious, and complicated conspiracy that lies behind this and to whom it might appeal? (The need for control)
2. Consider a scenario where a high proportion of world leaders, particularly from countries where there has been a lot of immigration, like Australia, Canada, U.S., New Zealand, Brazil, Argentina and so on over the last decade have had surnames that sound distinctly Italian. Think of a conspiracy that you could argue to "make sense" of this phenomenon. (Pattern finding)
3. Imagine you live in a farming community that, through public protest, has blocked the development of a mine that is likely to cause toxins to enter the water table. Most of the crops in your community have become diseased with a rare fungus. Propose a conspiracy and, if you like, invent some further "evidence". (Intentionality bias)
4. A private plane piloted by a local man crashes. You take no notice. The following month your prime minister and her cabinet are flying to a summit meeting in Geneva when the plane crashes, without apparent explanation. What kind of conspiracy can you imagine, and what would add fuel to the fire of your theory? (Proportionality bias)
5. Every few years, the cattle in your part of the country become infected with a disease that badly damages the herds, but usually the herds recover health within a year or two. Government scientists propose an effective method of genetically testing the cattle to see which ones are "silent carriers" of the disease. You argue against this, speculating about some of the motives of the scientists, and the dangers of what they propose. What is your underlying fear? (Perceived risk)
6. You hear rumours that there were strange lights appearing in the night sky south of your town. You decide to research, and do an internet search under the heading "are ufos real?". You find the following websites and read them before forming your theory: (Confirmation bias)
  - <http://www.truthbeknown.com/aliens.htm>
  - <http://www.inquisitr.com/1569327/ufos-are-real-top-area-51-scientist-reveals-in-deathbed-video-18-aliens-work-for-u-s-govt/>
  - <http://www.ufointernationalproject.com/latest-news/russia-ufos-are-real-and-we-know-how-to-summon-them/>

Part of the value of looking at how conspiracy theories arise from the "natural" inclinations of our brains, however, is to sensitize us to the extent to which those biases can influence our judgments even when we are not thinking about conspiracies.

## Exercise 2: Identify the cognitive bias.

**INSTRUCTIONS:** In the following examples, pick out which of the six cognitive biases treated here is demonstrated. Some instances could arguably have more than one bias, depending on the interpretation. As you consider these, note which ones could lead "naturally" to a conspiracy theory.

1. "When everything else seems crazy in this messed up world, I turn to my president--there's someone I can believe in, someone I can trust." (The need for control.)
2. "If you look at all details, you can't help but noticing that every time the government promotes a vaccination program against polio, this occurs shortly after the government has also reported a budget deficit. That's more than coincidence. Obviously someone is trying make money through the pharmaceutical industry." (Pattern finding)
3. "Haven't you wondered why, suddenly, from nowhere, a devastating epidemic like ebola suddenly spreads through certain, select African countries? " (Proportionality bias)
4. "My aunt was told she probably had just a year to live and this was ten years ago. Last year she won a large lottery prize and created a children's charity with the funds. It seems to me this isn't just blind luck. There has to be another explanation. Everything happens for a reason." (Intentionality bias)
5. "I think it's foolish to try to interfere with the natural course of the disease. Who knows what dangers that might precipitate?" (Perceived risk )
6. In 1939 in Germany and Austria, in spite of increasing anti-Jewish laws, violence against Jews, and public rhetoric directed against Jews, many Jewish families decided to stay rather than leave the country. Although no doubt the reasons for not leaving were complex, which cognitive bias might have reinforced the inclination to stay? (Perceived risk )
7. "Every time a woman is elected as CEO of a major corporation, the stock market drops. It's not hard to figure out what's going on here." (Pattern finding)
8. "Think about it. I walked into the library in order to renew my book, the only time I've ever done that. Who should I bump into but Dolores, my high school sweetheart, in town visiting her sister for one day only. Well, one thing led to another...and, now we're just about the perfect couple. It was clearly meant to be." (Intentionality bias)
9. "I know it was a terrible accident, the mudslide that wiped out the village. But, who knows what sinful behaviour was going on in that village?." (Intentionality bias)
10. "I don't think we should try to interfere with the gang warfare on the lower east side of the city. Who knows what the consequences could be on the rest of the city? We're safer just to leave things as they are and let those druggies sort themselves out." (Perceived risk)
11. The riot that swept through the city couldn't have been caused simply by that single incident of police brutality reported in the papers. That was too small an incident to have such a big impact. (Proportionality bias)
12. "I don't care what theories and statistics you spout about the beneficial effects of immigration on the economy. All my friends and the leaders of my political party agree: immigrants are a drain on our resources. " (Confirmation bias)

The third and last exercise focuses more broadly, beyond just cognitive biases, to more general skills of critical thinking. Students have to take into account social and historical influences of which they may be aware. This one could be used an entertaining guessing game – true or false? -- or an activity of



research. As a final exercise on cognitive biases and critical thinking, it has the merit of providing some real life examples. (Answers at the end.)

### Exercise 3: Test your own “conspiracy detectors”.

Using whatever quick research skills and critical thinking skills you have, see if you can find which ones of the following were largely verified conspiracies and which have no credible evidence.

1. Military leaders planned terrorist attacks in the US to drum up support for a war against Cuba.
2. Public water fluoridation is really just a secret way for chemical companies to dump the dangerous byproducts of phosphate mines into the environment
3. Parts of the Gulf of Tonkin Incident, which led to US intervention in Vietnam, never happened.
4. The Food and Drug Administration is deliberately preventing the public from getting natural cures for cancer and other diseases because of pressure from drug companies.
5. A public-relations firm organized congressional testimony about maltreatment of babies, that propelled US involvement in the Persian Gulf War.
6. Health officials know that cell phones cause cancer but are doing nothing to stop it because large corporations won't let them.
7. The CIA deliberately infected large numbers of African Americans with HIV under the guise of a hepatitis inoculation program. <http://www.businessinsider.com/true-government-conspiracies-2013-12><http://www.npr.org/sections/health-shots/2014/03/19/291405689/half-of-americans-believe-in-medical-conspiracy-theories>

### ANSWERS

**Almost certainly true:** 1, 3, 5

**Almost certainly untrue:** all the others

If you're interested in using these exercises in class, please feel free to adapt them to whatever you think would work best for your own context.

### Conclusion

In recent posts, we've given a lot of attention to public knowledge claims that are NOT true – Eileen treating “con artists” and Theo treating conspiracy theories. Why have we focused on conscious swindles and inadvertent false beliefs in this way? Why not simply treat knowledge claims that have the *best justifications*, the *most reliable* ones we have achieved so far? After all, TOK is a course that aims to deal with *well* supported shared knowledge, and the methods we use to achieve it.

But there is a lot to be gained by “teaching backward”. But enough for now! We'll come back to this point another day.

April 11, 2016

## “Natural selection” and the early career of a metaphor

(by Eileen Dombrowski) “Metaphors, as we all by now know, aren’t just ornamental linguistic flourishes—they’re basic building blocks of everyday reasoning. And they’re at their most potent when they recast a difficult-to-understand phenomenon as something familiar.” [So writes cognitive scientist Kensy Cooperrider](#). In giving the backstory of Darwin’s choice of “natural selection” for evolution, he provides a short article for any Theory of Knowledge teacher to note, relevant to language as a way of knowing and the natural sciences as an area of knowledge.

This example is probably a familiar one to most TOK teachers, but I recommend this article for the way it handles metaphor. It comments both on the implications of “natural selection” in particular for how we think and, more broadly, on how metaphor affects thought. I also like it for use with students because it tells a story. I’ve blogged recently on the [role of storytelling in knowledge](#) – for good and ill – and am more convinced than ever (happily confirming my own biases!) that good class material for catching student interest is often laced with stories.

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April 25, 2016

## “Who’s an Indian now?”: concept, definition, and significant ruling

(by Eileen Dombrowski) A unanimous [ruling by the Supreme Court of Canada on April 14](#) gives us a dramatic example to take to a Theory of Knowledge class: Métis and non-status aboriginal people in Canada are now defined as “Indians” by the federal government. The people who now fit into this category are celebrating. The implications are significant for the rights they can now claim, the programs and services to which they now have access, and the increased clarity of their place in federal and provincial jurisdictions. Moreover, some consider it to be an acknowledgement of their history and a validation of their identity. But why do I suggest a judicial ruling with political ramifications as an example for a class on knowledge? What does it illustrate that is relevant to our course?

### 1. Knowledge questions of classification

*For one thing*, it provides an example of the complexities and uncertainties of classifying phenomena, specifically human beings – and yet the huge implications for people of their being categorized in a

particular way. Supreme Court Justice Rosalie Abella wrote in her verdict, “There is no consensus on who is considered Métis or a non-status Indian, nor need there be. Cultural and ethnic labels do not lend themselves to neat boundaries.” The judge overrides distinctions earlier considered important and adopts an inclusive definition for aboriginal people.



This issue of classification involves numerous ways of knowing (notably sense perception, intuition & reason, and language) and runs through areas of knowledge, with particular relevance in this case to the human sciences and history. A few over-arching knowledge questions stand out:

- How do the categories our societies and languages have constructed for things and ideas affect how we learn and build our knowledge?
- What is the relationship between a concept and a definition? What ways of knowing are involved in establishing and changing concepts and definitions?
- How does the way we categorize the world affect what we think is good action (ethical, effective) within it?

If you’ve read much of my book (Theory of Knowledge Course Book, OUP) or if you’ve been following my blog, you’ll already know that I find these topics totally riveting, both for the way that shifting concepts connect with research and writing and, even more, for the way that concepts affect how people treat others in the world. If you share my interest, you may want to check back to related posts I made when preoccupied by the topic last June:

June 14, 2015 [“Passing” as black: classification and social implications](#)

June 17, 2015. [Classification and implications: Who is black, or indigenous, or Jewish?](#)

June 20, 2015. [World Refugee Day: What do our categories leave out?](#)

## 2. Knowledge questions regarding definition

*For another thing*, definitions can be just so important – clever attempts to clarify things and ideas so that we can talk about them with a shared understanding of what we’re talking about. (Always a good idea!)

And yes, they can be peaceful. They may be no more than calm moves in a language game (WOK language), as we use some words from our collection to set the boundaries of others, and thus share our knowledge. Not a lot of sex, violence, and power struggle evident in the grey columns of text of your average dictionary!

But definitions can also be *weapons*. As we watch elections being fought and witness the struggles to protect -- or not! -- our natural environment, we become spectators of language wars. Whose categories and terms will take over public discourse and push people to think in a certain way? Who will succeed in toppling opponents and their views into deep pits of unflattering terminology and seize control of the dominant concepts and terms on the battlefield of public media?

Similarly, pushing concepts and their definitions to the fore of public awareness can be political and fierce. Did you know, for instance, that "sustainable" is a recent word? Three decades ago, most of my international students were vague about the word, and two decades ago most of them couldn't find an equivalent in their own languages. I'd bet they could now! Behind this now-common concept and familiar word lies development of ideas within the natural sciences and economics. But there also lies a history of resistance to the dominant worldview, and some success in persuading the public and leaders to re-conceptualize situations and talk about them in a different way.

Challenging past definitions, too, can involve contest. The particular case of the Canadian Supreme Court changing the definition in law of "Indian" is a potent example of the relationship between language and power – power in this case exerted through a legal system that is one of the functions of government. Allow Métis and non-status aboriginal people into the category, and instantly they gain certain rights, greater control of aspects of their own lives, and access to some government programs. But it wasn't a spontaneous choice on the part of the Supreme Court to reconsider the definition: the legal decision came in response to a challenge launched by a Métis leader in 1999, which first came to trial in 2011, with the decision reached finally this month.

A definition in law, though, isn't necessarily the common understanding of the term. More informally, the term "Indian" carries an array of connotations, such that many of our Canadian indigenous peoples reject the word and prefer the use of "First Nations". I certainly wouldn't call my neighbours on the nearby [Snaw-Naw-As](#) reservation "Indians" in my own language context.

But, of course, in TOK the particular example, interesting though it may be in itself, isn't what ultimately matters. In our TOK classes, its role is to illustrate and develop broader knowledge questions -- many of which are even more interesting (and potent for thought and action!) than the examples:

- What is the relationship between a concept and a definition? To what extent does your response to this question depend on whether you are thinking about mathematics, physics, or contemporary politics around race and the environment? (knowledge framework: concepts/language)

- How do differing, and shifting, perspectives in history affect how we name events in the past, talk about them, and integrate them into our understanding? To what extent do these ways of talking about our past have resonance for how we see our present?

### 3. Areas of knowledge: indigenous knowledge

Of course, you knew I'd arrive here – at indigenous knowledge. Isn't the naming of this area of knowledge a debatable issue of definition in itself?

I really like the ambiguities and inconsistencies that the category "indigenous knowledge" tosses up for us to look at! The very concept of this area of knowledge differs from the academic areas we treat. In areas of knowledge such as science and history, the people who are active in the field take their name from what they do. They are "scientists" or "historians" because they engage in the work of science or history. But in the TOK category "indigenous knowledge", the knowledge is named for the category of people who possess it.

So....who is categorized as "indigenous"? (Clearly, we don't always need the Canadian Supreme Court for this!) And what common characteristics does the knowledge possess, if any, that makes it *distinct* from other knowledge? Do the people of diverse cultures around the world possess "indigenous knowledge" in the same way or to the same degree? What, really, are we talking about, and -- when people are categorized as they are being colonized -- from whose perspective? (If you're interested in what I've written in the past about Indigenous Knowledge in TOK, you need only find the tag cloud on this page and click on the term or, for more, try the tag cloud on my personal website [Activating TOK](#).)

And I'm sure I'll be coming back to this topic, one way or another, given the immediate world in which I live. Canada is a country to watch for how it develops its relationship with its indigenous peoples over coming years – how it handles current crises including epidemics of suicide, and how it acts upon the conclusions of the Truth and Reconciliation Commission's reports. My country's continuing interaction with its own First Nations will be affected by many of the topics we discuss in Theory of Knowledge: how knowledge is constructed, whose knowledge counts (and why), what perspectives are included as valid, and what interpretations win out in law, history, the human sciences, and the public mind. Canada is at a point, politically, where change may be possible.

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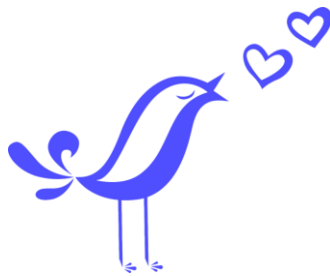
May 9, 2015

## Untranslatable: some goodies for your collection

(by Eileen Dombrowski) Words claimed to be “untranslatable” are often a tease. If they were truly untranslatable, we would have no access to them whatsoever. What makes many examples delightful is that, in fact, we *can* translate them. We won’t feel the resonance that the words possess for native speakers, of course, but we often have access to the core meaning in a way that provokes pleased surprise at unfamiliar packaging of ideas – and perhaps a smile of recognition.

We Theory of Knowledge teachers *collect* words like that to enliven discussions of languages mapping out the world in different ways, and to stimulate student curiosity about some of the more profound differences -- in language, and in cultural conceptions of the world. Would you like a few appealing words to add to your collection?

Today, I have a couple of sources of such words to pass on to you. On this sparkling morning, my favourite is surely the Swedish word *gökotta*. It translates literally as “early-morning cuckoo” and means waking up early to hear the first birds sing. I hope it carries connotations of joyfully greeting a new day.



Steve Mirsky, writing in [Scientific American](#), has his own favourites, leading with the Inuit word *iktsuarpok*, which “refers to the anticipation one feels when waiting for someone, whereby one keeps going outside to check if they have arrived.” Mirsky sees use for it, in his own cultural context, when anticipating a pizza delivery! He draws his examples from a [cross-cultural linguistics study](#) by psychologist Tim Lomas, a work of research in progress to which you and your students could contribute. The reader comments are also enjoyable, adding words and conveying some sense of their connotations.

Another source not to miss is the illustrated list in *The Guardian* last year: [“From mangata to kilig – 10 untranslatable words in pictures”](#). Writer Holly Young takes some of her own favourites from a book by Ella Frances Sanders. Among them are words that I realize I’ve always been missing. In Hawaiian *at last* I find – with a huge laugh of recognition -- the very word I’ve needed. “*Akihi*: listening to directions and then walking off and promptly forgetting them.” So goodbye, for now. It’s still morning here, and, fortified by realizing that there are others out there like me, I’m off to try to find my way in the world.

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May 23, 2016

Beasts, whirligigs, and raindrops: engineering, art, and the play of the imagination



Theo Jansen's Strandbeest wind sculptures

<https://www.youtube.com/watch?v=MYGJ9jrbpvg>

(by Eileen Dombrowski) On this fine day in May, most Theory of Knowledge students in the northern hemisphere are surely preoccupied with only a certain aspect of knowledge: how well to *demonstrate it*, in relevant forms, on examinations. So today let me suggest that tired students deserve to be invited away from exam stress through their senses and imaginations, and through a gentle form of TOK reflection.

I'd give them no taxing questions, but instead the chance simply to watch and respond to [Theo Jansen's Sandbeasts](#):

There are some easy follow-up questions as students respond to what they've seen:

- What ways of knowing are involved in a response to the "sandbeasts"?
- What areas of knowledge come together to create these splendid "beasts"?

After a bit of conversation, I'd show them more images, some [kinetic sculptures by Anthony Howe](#): (<https://www.youtube.com/watch?v=RJu5i1SMaiw>)

And then I'd move on to ["Kinetic Rain" in Changi airport in Singapore](#): (<https://www.youtube.com/watch?v=jhP9n6WvVfQ>)

Follow-up questions? You'll probably want to ask something along the line of these:

- In these kinetic sculptures, how would you describe the roles of the applied sciences and the arts, and their interaction? What does each contribute?
- How does the imagination act as a way of knowing in both the *creation* and the *response* to Jansen's Sandbeasts, Anthony Howe's wind sculptures or the airport's intricate play of raindrops.
- Which works do you like? Why?

At this point in the year you can probably drop the questions casually, allow students to take pleasure in the refreshment that these art forms bring, and sit back for some easy conversation. The examination hall has been treating knowledge as something students must articulate and demonstrate, under pressure of time. But perhaps knowledge does not always need an analytical focus and careful wording, much as we prize these characteristics. Today, exam-stressed students might enjoy a TOK class that emphasizes just relaxed response and gentle reflection.

June 6, 2016

## "Genocide": what we call things MATTERS

(by Eileen Dombrowski) May no student graduate from our course without a sensitive awareness that what we call things truly matters! This week's illustration is a rather grim one, but one that resonates with TOK topics: language as a way that we gain knowledge, influenced by how we categorize; concepts and naming as important issues in every area of knowledge, to the extent that the topic is given special emphasis in the knowledge framework. This particular illustration also demonstrates that history as an area of knowledge is not entirely about the past:



“Lawmakers in Bundestag, Germany’s lower house of Parliament, voted overwhelmingly Thursday to label as ‘genocide’ the mass killings of Armenians during the dying days of the Ottoman Empire—a move that has angered Turkey. The issue is a sensitive one in Turkey, the successor to the Ottoman Empire. Ankara acknowledges there was violence against Armenians during the period, but denies the actions constituted a genocide...With their vote Thursday, German lawmakers joined colleagues from more than 20 countries, including France and the Vatican, who have labeled the actions genocide—as have most non-Turkish historians. Turkey denounced the vote.” from *The Atlantic*

Why does naming matter *so very much* in this case, to the extent that calling the death of as many as 1.5 million Armenians “genocide” involves a decision in German parliament (as it has in other countries) and precipitates a diplomatic incident as Turkey recalls its ambassador from Germany? Turkish news agencies have similarly responded by comparing German Chancellor Angela Merkel to Hitler.

This would be a splendid Real Life Example for a student presentation, but also an effective example for teacher-led discussion on knowledge questions of *naming* and *knowing* – and on *not-naming* and *not-knowing*. If you’re on holiday at the moment, though, put this dark example aside for later.

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June 20, 2016

## The Beach Beast: perceiving pattern, playfully

(by Eileen Dombrowski) Cute, isn't he? May I introduce to you the Beach Beast, and a playful class example for *sense perception* and *intuition* as ways of knowing? Oh yes, we TOK teachers all have our collections of optical illusions and suggestive images to create a gestalt moment. (*Aha!*) We might even use the word "pareidolia" in class for the brain's inclination to find pattern in random sense perceptions – with human faces, for example, startlingly apparent on the surface of the moon or the melted cheese sandwich on our plate. But, really, I think you'd have to go far to find an example with the appeal of my local Beach Beast!



A friend of mine took this photo and circulated it with delight. Can you see why? For a bit of fun in class, why not show it – or rather, show *him* -- to your students and ask them to give him a name? With a bit of luck, you'll find they respond to the image and even begin to attribute personality to the Beast.

Lest you wonder, I assure you that I *do* realize that the Beach Beast is nothing but whorls of shape in a log – nothing but random pattern in wood. But, again with a bit of luck, showing his face may have provoked some smiles in your class and cascades of personal anecdotes about seeing faces in the plaster on walls, on the front of cars, in the shapes of clouds.

...and from there, it's a small step to numerous knowledge questions of what we bring, as human observers, to the act of observation. Our ways of knowing of intuition, sense perception, emotion, and imagination are all actively engaged -- and what we interpret from all the stimuli around us depends so much on what we carry already, even down to faces being a preferred pattern for our brains.

If you want to read out some text to augment discussion, it's easy to find, including in my own [Theory of Knowledge Course Book](#). The following passage from an [article in Live Science](#) would do nicely:

"Carl Sagan, the American cosmologist and author, made the case that pareidolia was a survival tool. In his 1995 book, "The Demon-Haunted World – Science as a Candle in the Dark," he argued that this ability to recognize faces from a distance or in poor visibility was an important survival technique. While this instinct enables humans to instantly judge whether an oncoming

person is a friend or foe, Sagan noted that it could result in some misinterpretation of random images or patterns of light and shade as being faces.

"Leonardo da Vinci wrote about pareidolia as an artistic device. 'If you look at any walls spotted with various stains or with a mixture of different kinds of stones, if you are about to invent some scene you will be able to see in it a resemblance to various different landscapes adorned with mountains, rivers, rocks, trees, plains, wide valleys, and various groups of hills,' he wrote in a passage in one of his extensive notebooks."

But let us not forget our Beach Beast! Even though your class discussion will have left the image behind as you get into the ideas, you might draw a bit more impact from it by showing a second version a second version of the shape in the beach log – but startlingly updated.



Yes, he's been defaced – in the most literal sense of the word. De-faced. Or maybe de-capitated, beheaded. Do some of your students respond with distress? If so, you can close the class with the realization of how easily we can be drawn in to the constructions of our senses and imaginations. My friend Karen Butler who took the photos was shocked and outraged when she discovered that someone had taken a chainsaw to the log -- and had removed the patterns in wood to which she herself had given a name and even (I suspect) some affection.

Showing students the second picture might be just *a little* fiendish if they shriek with dismay. But, even if they never learn to spell "pareidolia", they might be more likely to remember the point.

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Images of the Beach Beast by Karen Butler, used here with thanks

July 18, 2016

## TOK and zombies

(by Eileen Dombrowski) Until this very moment I hadn't realized exactly what's been missing in my TOK classes. *Zombies!* I've been missing *zombies*. For years I've introduced terms such as "justification", "counter-argument" and "refutation". For years I've compared areas of knowledge on the basis of whether their knowledge claims could be tested, and whether and why people in those fields would consider rejecting them. "And so you should," you might say. After all, that's core TOK. But don't you think it lacks a bit of...*je ne sais quoi*... a bit of colour, perhaps...a bit of *personality*? Wouldn't students find refuted ideas much more attractive if presented in terms of *zombies*?

"Some ideas from the past... are just dead wrong and really should have been left to rot. When they reappear, what is rediscovered is a shambling corpse. These are zombie ideas. You can try to kill them, but they just won't die." This comment in an excellent recent article by Steven Poole in *The Guardian* put an immediate smile on my face. (["Why bad ideas refuse to die"](#))



Wouldn't it add a bit of fun to class to have zombies occasionally shambling metaphorically through? I've bumped into the term "zombie ideas" before, but never before considered using it to animate a class with images from the zanier side of popular culture. Nobel laureate economist Paul Krugman, for one, [uses the term](#) for ideas that linger on in the popular mind long after they have been discarded by appropriate areas of knowledge: "a proposition that has been thoroughly refuted by analysis and evidence, and should be dead – but won't stay dead because it serves a political purpose, appeals to prejudices, or both."

I recommend the enjoyable article by Steven Poole for the treatment it gives zombie ideas (["Why bad ideas refuse to die"](#)), dealing with their range and the reasons for which they live on. And I invite you to join me in using the metaphor "zombie ideas" to engage student imaginations. *Why have I never done this before?* After all, some of the most influential ideas of our current era, such as the continued denial of climate change that clings on persistently in some forums, have zombies lumbering through them, preserved as undead by political and economic interests. We can deal with these in class with

abstract terminology and earnestness, assuredly. But we can probably deal with them more effectively when also using vivid images and humour.

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July 25, 2016

Indigenous memory codes, the wisdom of crowds, and other summer listening



(by Eileen Dombrowski) *Surely* in the holiday sunshine of a northern hemisphere summer we TOK teachers deserve to rest our minds -- even as we nourish them. Do you share this belief? If so, you might, like me, enjoy listening to interviews or thoughtful conversations while preparing salmon for the barbecue, watering the garden, or walking on the beach. Often, podcasts treat ideas not with bullet-point-analytical-delivery but with chatty interviews and reflective conversation – more diffuse, more relaxing.

Recently, I've found myself particularly interested in programmes on psychology – on how our human minds actually work. With the media so full of dramatic political events, *less and less* am I persuaded that people reach conclusions on the basis of evidence and sound reasoning – and *more and more* do I think that TOK benefits from awareness of cognitive psychology. Similarly, in these mind-drifting days of sunshine, I find myself intrigued by discussions about memory.

I'll pass on below three of the podcasts that have been my newest favourites in these summer days, and invite you to comment on any other TOK-relevant ones of your own. The descriptions I've given are those provided by the podcasts themselves.

### 1. **The Human Zoo**, British Broadcasting

Corporation <http://www.bbc.co.uk/programmes/b036tbly/episodes/downloads>

*"The series that looks at current events through the lens of psychology. Michael Blastland explores the quirky ways in which we human think, behave, and make decisions."*

e.g. "Democracy and the wisdom of crowds". July 13, 2016

"Trust me...I'm an expert". July 5, 2016.

"Short cuts to the simple life". June 21, 2016.

"As a matter of fact..." June 14, 2016.

I've only just discovered this BBC podcast, and I'm snacking my way with pleasure through back-episodes.

### 2. **All in the Mind**, Australian Broadcasting

Corporation <http://www.abc.net.au/radionational/programs/allinthemind/>

*"An exploration of all things mental, All in the Mind is about the brain and behaviour, and the fascinating connections between them."*

e.g. "**The Indigenous memory code**". July 3, 2016

Traditional Aboriginal Australian songlines hold the key to a powerful memory technique used by indigenous people around the world. *relevance*: memory, indigenous knowledge

### 3. **Hidden Brain**, National Public Radio, USA <http://www.npr.org/podcasts/510308/hidden-brain>

*"The Hidden Brain helps curious people understand the world – and themselves. Using science and storytelling, Hidden Brain's host Shankar Vedantam reveals the unconscious patterns that drive human behavior, the biases that shape our choices, and the triggers that direct the course of our relationships."*

e.g. "**The Scientific Process**, Episode 32". May 24, 2016.

Lots of scientific studies fail to produce the same results when they are repeated. How do scientists know what's true? *relevance*: human sciences

These three podcasts above stand out for me this summer. Four others that have a longer history as part of my background TOK-relevant listening include the following:

### 1. **Rationally Speaking**. New York, USA <http://rationallyspeakingpodcast.org/>

*"Rationally Speaking is the official podcast of New York City Skeptics. Join Julia Galef and guests as they explore the borderlands between reason and nonsense, likely and unlikely, science and pseudoscience."*

**2. Science Weekly**, The Guardian, UK <https://www.theguardian.com/science/series/science>

*"The award winning Science Weekly podcast is the best place to learn about the big discoveries and debates in biology, chemistry, physics, and sometimes even maths. The Guardian science team, [Nicola Davis](#), [Ian Sample](#), and [Hannah Devlin](#), meet the great thinkers and doers in science and technology. Recent shows include discussions on the future of gene research, the truth about radiation, how the human voice works, and the psychology of money."*

**3. Point of Inquiry**. Amherst, New York. <http://www.pointofinquiry.org/>

*"Point of Inquiry is the Center for Inquiry's flagship podcast, where the brightest minds of our time sound off on all the things you're not supposed to talk about at the dinner table: science, religion, and politics."*

**4. Inquiring Minds**. San Francisco, USA. <http://www.motherjones.com/category/secondary-tags/inquiring-minds>

*"Each week Inquiring Minds brings you a new, in-depth exploration of the places where science, politics, and society collide. We're committed to the idea that making an effort to understand the world around you through science and critical thinking can benefit everyone—and lead to better decisions. We endeavor to find out what's true, what's left to discover, and why it all matters with weekly coverage of the latest headlines and probing discussions with leading scientists and thinkers. Inquiring Minds is hosted by neuroscientist and musician Indre Viskontas and science educator Kishore Hari."*

How did we ever manage in the days before internet radio, podcasts, and mp3 players? I recall ordering cassette tapes in the mail nearly 4 decades ago, so that I could listen to interesting programmes while washing dishes or folding mountains of cloth diapers – in those days long before the internet enriched our lives. But now – I revel in how easy it is to be connected with a larger world.

Of the two of us, it's my husband Theo who is the more committed follower of podcasts, at all seasons. And perhaps an onlooker might find some comedy in seeing the two of us cross paths, me with a hot pink i-shuffle clipped to my shirt, he with one in lime green. But then we can unplug and talk about what we've heard. It's just another one of the pleasures, and not just of summer.

Image: <https://pixabay.com/en/silhouettes-person-human-man-woman-776670/>

August 1, 2016

"Bomb detector": knowledge goes horribly wrong



(by Theo Dombrowski) 300 people are dead as the result of one disastrous failure with "shared knowledge": in Baghdad, a bomb detector costing tens of thousands of dollars failed to sense a terrorist bomb. Was this tragedy a failure in technology? No. It was a failure in *knowledge*. Who *claimed*, and who *believed* that the device really could detect bombs? For a TOK classroom, the fake bomb detector provides teachers with a powerful story, a striking example of some key issues surrounding knowledge, and an exercise in applying critical thinking to claims with evident consequences.

### Consider:

1. The so-called bomb detector was nothing of the sort: it was a plastic handle with a small antenna.
2. The Iraqi officials responsible for issuing this "detector" and hundreds of others to the armed forces had been told repeatedly that the detector was a fraud--and that the British manufacturers of the fraud had many years ago been sentenced to a 10 year prison term for the fraud.
3. As a result of the spectacular demonstration of the dangers involved in trusting the fake devices, the detectors have been banned in Iraq--but continue to be used not only in Iraq but in some other countries.

### How did knowledge go so horribly wrong?

The answers are complex and cut across several different areas--advertising, pseudoscience, deliberate fraud, bureaucracy, political manoeuvring, corruption, and, perhaps, most powerfully for TOK, cognitive glitches.





2008, Iraq: Soldier uses the "bomb detector" during a security check

Treated chronologically, from the invention and marketing of the devices to their continued use, the problems with vaunted knowledge going horribly wrong include the following:

## 1. Language

Those involved with creating and advertising the useless devices, knew what they were about. Adopting a kind of toy "golf ball detector"--equally useless--they, like many fraudsters, especially in medicine, coopted the **language of pseudoscience** to create an aura of credibility.

- The device (in the most widespread version) was sold using the pretentiously technological name of **ADE651** by a company called **ATSC**.
- The device claimed to use "**programmed substance detection cards**" which were tuned to the "**frequency**" of explosives. The technology was (of course!) based on "**nuclear quadrupole resonance (NQR) or nuclear magnetic resonance (NMR)**". Impressive? Of course!--though, surprisingly, the fraudsters didn't abuse the standard scientific terms common to pseudoscience--quantum, nano, and "energy field"!
- Other versions, sold by other fraudsters to governments in Mexico, Thailand, Egypt and Niger, went by equally fine-sounding names: the "GT200", "remote substance detector" and the "Alpha 6".

For TOK students the issue is obvious: how much should we trust technical names and technological terminology that we don't understand? How can we assess such impressively scientific sounding language?

## 2. Credible authority/false premise

The credibility of the devices was enormously enhanced because they were backed by British embassies in Mexico City and Manila, through the Department of Trade and Industry.

Clearly the issue here is complicated for TOK students--and us all. How do we assess the reliability of knowledge sources in a particular case when, in most cases, those knowledge sources are demonstrably reliable? Amongst other things, of course, we must question the premise that "a knowledge source that is generally reliable must be always reliable."

### 3. Skeptics, critical thinking and deduction

In spite of the bafflegab of the language--or, more likely, because of it--many critical thinkers smelled a rat. Eventually, governmental agencies, both in the U.S. and in the U.K. examined the devices and found them to be nothing, nothing, *nothing at all*.

But--and here is a good lesson for TOK students--amongst those quickest off the mark were those who applied various versions of critical thinking--or just plain common sense.

From their initial use in Baghdad many years ago, soldiers mocked them, claiming that too much aftershave could set them off.

Others, principally citizen skeptics, largely applying principles of **deduction**, concluded that the devices couldn't possibly work. Why? Well, first, the manufacturers (a slightly grand word for a not very grand backyard operation), claimed that they could be used for just about anything: simply by putting a sensor card in a closed chamber with a fragment of a substance--including illegal ivory and truffles!--the user could then shift the sensor card to the device, and presto!

Second, they claimed the device could be used over distance, through concrete and water--without any scientifically credible explanation of how this could possibly be done.

For TOK students, the problem is a vivid demonstration of the principle popularized by Carl Sagan, "Extraordinary claims require extraordinary evidence."

### 4. Tests: induction and the scientific method

Initially, it seems, one skeptical organization, run by retired millionaire magician James Randi, hired an independent company to test the identical American fore-runner of the ADE651--the "Quadro"--and demonstrated, through testing, that the devices could do nothing.

These tests were ignored by the FBI. Later, government testing both in the U.S in 1996, and the U.K., where the devices were marketed under the name "Mole", again demonstrated that the devices were completely useless.

In 2010, the British banned their export and subsequently jailed the con-artists.

The matter should, of course, have stopped here. TOK students will point out that it would be difficult to argue against the results of this kind of test, where the human element can be removed, leaving only scientifically verifiable--and repeatable--evidence.

Yes? Well, not quite.

### 5. Tests: ideomotor effect

The fact is, however, that subsequent tests, principally run in Iraq, showed, against any scientific possibility, that on some occasions they *did* seem to work. How could this be? Putting aside other explanations for now, particularly interesting for TOK students is the principle of the **ideomotor effect**.

Consider [the following incident](#):

"General Jabiri, meanwhile, challenged an NYT reporter to test the ADE 651, placing a grenade and a machine pistol in plain view in his office. Every time a policeman used it, the wand pointed at the explosives. Every time the reporter used the device, it failed to detect anything. "You need more training," said the general."

Are we to conclude that Jabiri was completely wrong-headed? Likely, yes. After all, the explosives were in plain view. But there is another possibility, one that links to subtle behaviour of the human brain.

*Popular Mechanics* uses the human failures involved in depending on fake bomb detectors to examine the **ideomotor effect**-- -- involuntary muscle movements that guide a device like a Ouija board "planchette", supposedly (in the case of the Ouija board) under the guidance of a spirit. (<https://en.wikipedia.org/wiki/Planchette>) Appropriately, the article is entitled "**The Military Pseudoscience that Just Won't Die**"

After writing about willow twigs supposedly used to detect water underground ("dowsing rods"), and then equally useless devices in the Vietnam war, the journalist concludes with the [description of a study](#) at the University of British Columbia involving the psychology of the ideomotor effect and its apparent effectiveness:

"If there are cues that you have not noticed consciously, but which have been tagged by your unconscious mind, dowsing may reveal that unconscious insight.

"The British Columbia study results suggest that, in theory, dowsing might provide a marginal edge for detecting IEDs. By harnessing unconscious knowledge, a person might be slightly more likely to spot a bomb and save lives. In that sense, dowsing might be better than nothing, but it's an idea best left in the past. McCormick was a criminal because he charged up to \$60,000 for a device that was no more effective than a pair of old coat hangers. For that price, you can get a real bomb detector that really saves lives."

## 6. Reactions to tests and human psychology:

In spite of overwhelming scientific evidence that these detectors

1. didn't work (induction) and
2. couldn't possibly work (deduction),

they continue to be used, both in remote parts of Iraq, and, amongst other places, Egypt, where they are supposedly programmed to detect HIV. (Yes, HIV!)

Admittedly, in the particular case of Iraq, it seems that there is a complex web of bureaucracy, corruption, and power politicking that lies behind much of their continued use (at least until the recent ban.)

## Cognitive biases and logical fallacies

However, perhaps the most important aspect of this whole story for TOK students is what it reveals about the human tendency to cling to irrational behaviour and/or beliefs in spite of irrefutable evidence to the contrary.

Consider the following brief accounts, in the light of such cognitive blunders. You might find it useful to look back to the first post of a two-part series we did in March in this blog, on "[Conspiracy theories, intuition, and critical thinking](#)". There we treated the following cognitive biases:

1. The need for control
2. Pattern finding
3. Intentionality Bias
4. Proportionality Bias
5. Perceived Risk
6. Confirmation Bias

To this list, you will probably want to add the following to deal with the problems raised by the knowledge claims about the fake bomb detector:

7. **Motivated reasoning.** This is a form of reasoning that takes confirmation bias a step further. It involves not just accepting as true only what accords with what we believe already (confirmation bias), but going further to reject as false anything that doesn't fit with it. Motivated reasoning "drives people to develop elaborate rationalizations to justify holding beliefs that logic and evidence have shown to be wrong. Motivated reasoning responds defensively to contrary evidence, actively discrediting such evidence or its source without logical or evidentiary justification. Clearly, motivated reasoning is emotion driven." ([See more on motivated reasoning.](#))
8. **Sunk cost fallacy.** When we have already put time or effort into something, we don't like the idea that we've been wrong or stupid, or that we've wasted our resources. So even if a procedure, a product, or an idea is increasingly revealed to be faulty, we resist changing our minds. We've sunk too much into believing it already! ([See further explanation.](#))
9. **Fallacy of cherry picking.** Lovely metaphor: a tree is covered with cherries (evidence) but we select only the cherries that suit our purposes and ignore all the others. "When only select evidence is presented in order to persuade the audience to accept a position, and evidence that would go against the position is withheld. The stronger the withheld evidence, the more fallacious the argument." ([See further explanation.](#))
10. **Texas sharp shooter fallacy.** Another good metaphor: a gunman fires random shots at a barn – but then paints a bull's eye target around where bullets just happened *accidentally* to hit most often. Looks like he's an excellent shot, and as if he's managed deliberately to hit that target! The metaphor applies to accidental clusters of random data (such as coincidences) when a pattern is imposed afterwards – and the data that doesn't fit the pattern is ignored. ([See further explanation of how we fall for this one,](#) with some entertaining examples.)

You will also find an overlapping treatment of cognitive biases in the chapter on "Intuition as a way of knowing" in the [Theory of Knowledge Course Book](#), and treatment of further logical fallacies in the book's inter-chapters.

### **TOK exercise: applying critical awareness and skills**

The four selected articles below provide rich material for identifying human cognitive tendencies and failures in thinking critically. The passages excerpted from them focus attention on particular quirks of the human mind.

**Article 1.** Caroline Hawley, "[The story of the fake bomb detectors](#)", BBC news, October 3, 2014.

Astonishingly, perhaps, some officials still blame user error or even the weather for the device's failure to detect explosives.

Gen Saad Ma'an, from Iraq's Ministry of Interior, accepts the devices are not working "to the required level" but says the country is still waiting to replace them.

"Maybe it's affected by conditions - by the weather, by how the policemen themselves are using it," he says.

**Article 2.** Martin Chulov, ["Iraq PM orders removal of British-made fake bomb detectors"](#), *The Guardian*, July 4, 2016.

Some security officials were slow to respond to the order, still holding wands on Monday at approaches to the central city and along roads to the airport and the north. The reluctance to acknowledge them as useless was in part centred in having to acknowledge that there are few alternatives to keeping bombers away from Iraq's towns and cities.

"Sometimes it is better to pretend," said one senior interior ministry official. "To say that these don't work says that we don't have anything better. The people need some sort of reassurance."

**Article 3.** Dominic Evans and Saif Hameed, ["Fake bomb detectors banned in Baghdad, but still in use from Beirut to Cairo"](#), *Albawaba news*, July 28, 2016.

Police captain Raad Shallal, manning a checkpoint near the town of Khalis in Diyala province said he knew the detector was useless.

"It serves as a scarecrow, more than a real bomb detector," he added, standing close to a colleague who was checking vehicles with one of the devices.

That theory, that they might deter bombers even if they cannot detect bombs, was lampooned on Iraqi television by satirist Ahmed al-Basheer.

"So it's a scarecrow," he said. "This is the right thing to do, use a device that the entire globe knows is not working in order to scare terrorists who live on the same globe we're on."

**Article 4.** Leo Benedictus, ["Why are countries still using the fake bomb detectors sold by a convicted British conman?"](#), *The Guardian*, June 9, 2014.

Like dowsers, though, many security personnel continued to keep the faith. In 2010, even after McCormick had been charged with fraud, Pakistan's Airport Security Force admitted to the Dawn newspaper that they were continuing to use a device of their own design that operates on the same principle.

In 2009, the New York Times confronted bomb squad commander Major General Jihad al-Jabiri with evidence of the ADE 651's fraudulence, yet he insisted that it was effective, saying: "Whether it's magic or scientific, what I care about is it detects bombs."

Detective Sergeant Steve Mapp, who led the investigation into McCormick, some people's belief in the ADE 651 is almost unshakeable. As he told Business Week, "In Kenya they said, 'No, we know about Mr McCormick's conviction, but we're really glad we've got them – and they do work.'"

## Conclusion

Have you noticed the range of dates across which the exposés of this fake bomb detector spread? Given the thorough debunking of the gadget as a bomb detector (and as a detector of golf balls and HIV!) it is astonishing that anyone persists in clinging to belief in its powers.

If this were an isolated incident, then all it would be worth in a TOK class is an anecdote and a laugh – or perhaps just a rueful head shake about the "funny old world" and "funny ol' human beings." And I suppose it deserves these anyhow. We need our laughs, and observing human beings certainly provides a dizzying number of rueful head-shakes!

But we can't *just* laugh. The failures that this story illustrates are dismally common: failure to evaluate effectively the reliability of our sources of knowledge; readiness to accept knowledge claims with insufficient or dubious evidence, and even at times with evidence to the contrary; cognitive resistance to questioning our beliefs and changing our minds once we've accepted a knowledge claim; and the possibly deadly consequences of false conclusions. In fact, we might not feel inclined to laugh *at all* over failures in critical thinking, given their possible consequences. Our students won't be in the position (we hope!) of shopping for bomb detectors, but they will make decisions about when to administer or withhold medical treatment (such as vaccinating children), or about how to place their votes.

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Image: Checkpoint in Abu T'Shir, Iraq by Todd Frantom [Public domain], via [Wikimedia Commons](#)



August 9, 2016

Getting it wrong, getting it right, and generating knowledge questions: "The Forgotten History of Autism".



[http://www.ted.com/talks/steve\\_silberman\\_the\\_forgotten\\_history\\_of\\_autism](http://www.ted.com/talks/steve_silberman_the_forgotten_history_of_autism)

(by Eileen Dombrowski) Rarely does a 14-minute talk hit so many ideas we explore in Theory of Knowledge or treat them so engagingly. In his 2015 TED talk "[The forgotten history of autism](#)", [Steve Silberman](#) hands us a splendid case study of failures and successes in the pursuit of knowledge, and the features that distinguished them. He treats central concepts such as classification (of conditions, of people) and identification of cause. Through his own storytelling, he conveys the humanity of the researchers – in both flaws and strengths – and the human impact of getting our knowledge claims right. At the same time, he comments on storytelling itself within knowledge and sets up, for a TOK teacher, an activity on identifying knowledge questions.

Clearly, I'm taken with this video. It's possible, though, that I'm particularly caught by my personal interest in the anti-vaccination/anti-knowledge movement and by my own recent reading about autism. Or I could be affected by the second cup of coffee I've just had. Judge for yourself. It could scarcely be easier with a TED talk, given its accessibility as a [video](#) or as a [podcast audio](#) (my own method) and the availability of a [transcript with timing](#).

For a TOK class, however, a video has to play a different role from videos in many other courses. Although it's often useful to have explanations or interviews on a screen, in TOK we're not out to convey information or "deliver" knowledge. We want to raise knowledge questions.

### **An exercise in knowledge questions**

So, if you share my interest in using this video, here is a suggestion. Ask your class to pick out and formulate knowledge questions as they watch and listen. Give them a few minutes after watching it to

read over the transcript and put their knowledge questions into words. Remind them that knowledge questions should be *open* (answers not implied) and *general* (applicable to many particular situations), and should be questions not about subject matter or information but about the process of knowing it or features of the knowledge.

This video hits enough possibilities for students to go in several directions as they write their knowledge questions. If they need some nudges, you might encourage them to base questions on a relevant idea that appeals to them within the following clusters:

- language as a way of knowing -- the effect of what we call things on how we understand them, and the effect on research and its conclusions of the concepts we use and the definitions we give them ("autism", "neuro-diversity"; "diagnostic criteria", reference to autism as an "epidemic")
- methods: difficulties of establishing causes -- human readiness to believe a simple explanation (such as the false one that vaccination causes autism) rather than a complex one; influence of beliefs about cause (e.g. parents are to blame for being cold) on the availability of evidence (e.g. counter-evidence hidden out of shame) in the human sciences; role in the sciences of challenges to established explanations and change in methods and conclusions

As the teacher, though, you're in a far better overview position yourself to introduce more reflective questions on the whole of Silberman's talk. I suggest a closer look at the idea of storytelling and a reflective consideration of the role of questions in the construction of knowledge.

### On stories

In his talk, Silberman uses the word "story" loosely as a version that links together different observations into an explanatory whole that affects our understanding. He speaks of three "stories":

- Kanner's categorization/definition and explanation of autism from 1943;
- the enlarged definition and understanding of autism in the late 1980s and early 90s initiated by research by Lorna Wing and Judith Gould, following from the work of Hans Asperger;
- and the fraudulent and debunked link by Andrew Wakefield between vaccination and autism.

Are these three all "stories" as we normally understand the word?

It's useful in TOK to preserve a distinction between *narration* and a *general picture* as different means of linking circumstances and events – sometimes expressed as a difference between *stories* and *maps*.

- A *narration* or a *story* deals with or creates patterns over time, often connecting very specific particular events. We expect narration to be a component of history and literature, and to be a component of the sciences when dealing with changes or developments in the natural world or human society across time.
- A *general picture* or a *map* creates or describes patterns that can be seen and applied broadly. We expect *the general case* to be central in the sciences, which aim to describe and explain how

things are. They don't tell just the particular story of a specific litre of water boiling at a precise temperature, but the general story of all litres of water boiling at that temperature.

For each of Silberman's three "stories", would accept his use of the word for the kind of knowledge that each one yielded? If all three – accurately or inaccurately – involve the creation of general cases, the broad explanations of science, then where does the storytelling lie? I think it's useful to distinguish between the stories of *how people create knowledge* (or revise knowledge, or reject knowledge claims), and the more general cases of the *kind of knowledge* that results.

### **On questions within knowledge**

It seems to me that a final reflection is certainly stimulated by what Steve Silberman tells us in this TED talk. "Amazingly," he says, "it wasn't until the 1970s that researchers began to test Kanner's theory that autism was rare." For thirty years, it had been accepted – despite the existence of Hans Asperger's alternative explanation of "autism as a diverse continuum that spans an astonishing range of giftedness and disability." It took Lorna Wing and Judith Gould to push the change in definitions and understanding.

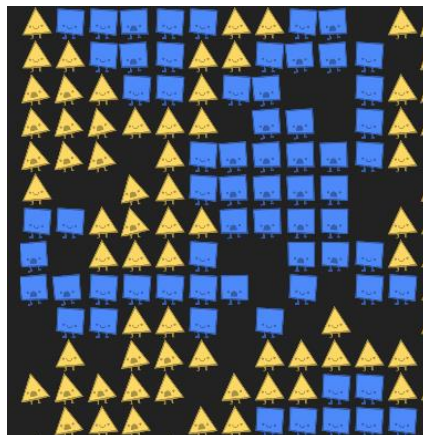
And perhaps this is good final reflection on the background on autism to which this talk introduces us: that knowledge doesn't "just happen", that it is constructed by human beings. Knowledge is built in response to the questions that we choose to ask and choose to pursue. We learn through asking the right questions.

August 17, 2016

## Small biases, large consequences: an interactive online game on diversity or segregation

(by Eileen Dombrowski) Often it takes dramatic illustration to convey *just why* certain abstract concepts are so important to thinking critically about knowledge. For demonstrating the significance of concepts of “bias” and “implications”, try this online game with your students. [“The Parable of the Polygons”](#) provides an attractive, interactive – and startling! – visualization of what can follow from accepting some initial ideas, or from being influenced by only *a little bit* of bias! Students can play the game online, make their own choices, and see the graphic results form before their own eyes.

Designers Vi Hart and Nicky Case open their game of squares and triangles with the idea that small individual biases can add up to a large collective bias: “This is the story of how harmless choices can make a harmful world.” Every polygon would prefer to live in a diverse neighbourhood...up to a point. The rule that guides the game is “I wanna move if less than 1/3 of my neighbours are like me.” The triangles and squares smile or wail until their desires are met. In the process, small individual biases add up to segregate the society: there are implications to the choices.



But the game can be played again and again. What happens to the neighbourhood if the bias is mathematically reduced? Can an increasingly open mind also be modeled through this mathematical simulation? Try it!

In their conclusion, the game designers link to further mathematical models of diversity, urge contribution to diversity education, and place their game firmly in the public domain. For educators, what is there NOT to like?

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August 30, 2016

## Burkini controversy: TOK activity in analyzing perspectives



[https://www.youtube.com/watch?v=TK\\_wlCKWgwE](https://www.youtube.com/watch?v=TK_wlCKWgwE)

(by Eileen Dombrowski) A storm of controversy over a swimming suit? Astonishingly, it's not even a risqué one! Women have recently been fined in France for keeping *too much* of their bodies covered on the beach – and towns have passed regional laws to ban the "burkini". The ban on this bathing costume, however, has met extensive protest. The top French administrative court has now overturned it. A cultural flashpoint hotly contested, the burkini offers an ideal class activity – not because the TOK course cares about beachwear but because the controversy provides material for students to consider the nature of symbolism and to practise their skills of analyzing perspectives in application to issues very alive in the world.

Basic to understanding language as a way of knowing and the nature of representation in the sciences, the arts, and other areas of knowledge is the concept of *symbolism* – that not just sounds and words but also objects, places, and actions can mean something beyond themselves, usually within a web of meanings. If I insist that the burkini is *really* nothing but cloth, you could agree, factually -- but at the same time justifiably accuse me of cultural ignorance! The burkini controversy centres on a piece of clothing – but as the garment provokes reactions, then reactions to those reactions. In the process, it brings to the surface a number of different cultural perspectives that are articulated, argued and shared in ways that make them accessible.

### **Burkini: class activity in analysis of perspectives**

If you use the burkini controversy in class, you might want to help your students deal quickly with some of the background: religious beliefs on appropriate attire and the relevance to the burkini, French attitudes and legal rulings on religious displays in public spaces in a state committed to secularism (*laïcité*), emotional reactions to recent terrorist attacks in France

increasing islamophobia, and the rights of women to choose what they wear. Some background is essential for understanding -- though they are likely gain that in any case if you just set them to reading.

To encourage students to practise their analytical skills, you might want them to refer to the [Theory of Knowledge course book](#) to keep handy to remind them of ideas to apply. In TOK, we don't want student just to *describe* perspectives in a he-said she-said way, but to use TOK concepts actively to *analyze* ideas. For instance:

- **Exploring differing perspectives**, p.28. This is a basic guide to analysis of the *components of perspectives*: assumptions, values, selection of facts, methods of verification, implications of accepting the point of view.
- **Fallacies of argument 1**: Errors in the reasoning process, p.126. This section is helpful for dealing with hasty generalizations, slippery slope arguments and grey scales, implied premises, and straw man arguments. Students should be learning to notice how these are used in argument.
- **Representation and perspectives**, p. 150. These pages are helpful for identifying characteristics of reporting that are tied to a perspective, such as selection, emphasis, colouring of emotion and values, relationship of parts, and framing in context.
- **Fallacies of argument 3**: misleading appeals to emotion, p. 171. Perhaps most relevant are the appeal to belonging and the appeal to anxiety or fear. Again, students will ideally be becoming more attuned to how these are used in argument.
- **Perspectives in normative ethics**, p. 265. This table sums up major lines of ethical argument. It's useful in understanding arguments based on consistent application of a principle (however interpreted) and those based on the effects of actions (however measured and predicted).

And then -- when they have come to grips with symbolism and the creation of cultural meaning through investigating this case study -- and when they have applied their minds to work through the different assumptions, values, selected facts, implications, and such -- *then* they are in a position to reach their own conclusions and formulate their own arguments. That's when we can feel satisfied that we have led a good class not on the burkini -- which has done its part in providing a fine example -- but on concepts in theory of knowledge.

### **Below: Some articles to start off student analysis of perspectives**

["France's burkini ban overturned by highest court"](#), CBC (Associated Press), August 26, 2016

*This AP article is about the ban at the point of having been overturned. Its retrospective view pulls together a number of different perspectives. Useful starting point.*

James McAuley, ["France's top administrative court overturns burkini ban"](#), *Washington Post*, August 26, 2016.

*This article is likewise useful in swiftly identifying major perspectives. It also includes photos of burkinis and a short explanatory video.*

Ben Quinn, "[French police make woman remove clothing on Nice beach following burkini ban](#)", *The Guardian*, August 24, 2016.

*This article gives information on the French towns to ban the burkini, and their association of the garment with Islam and recent terrorist attacks. It also includes a photo of four French policemen standing over a woman and apparently telling her to take off her clothing – a photo that many commentators took to be much more meaningfully symbolic than the garment itself.*

Geoffroy Clavel, "[Nicolas Sarkozy Promises Nationwide Ban Of Burkinis If Elected](#)", *HuffPost France*, August 26, 2016.

*This article gives the former French president's reasons for supporting a ban on the burkini, quoting him as describing wearing burkinis as "a militant, provocative, and political act."*

"[Nice Deputy Mayor: Burkini is an 'Islamist provocation'](#)", *BBC Newshour*, August 24, 2016.

*This radio clip features the deputy mayor of Nice, one of the towns that instituted the ban, defending his point of view that the burkini is an "Islamist provocation."*

"[Canadian-Israeli modest swimwear designer decries flap over burkinis](#)", radio *As It Happens*, Canadian Broadcasting Company *CBC*, August 26, 2016.

*This radio interview with a designer puts the burkini in a larger context of women's swimwear for modesty and religious dictates, not specifically for Muslim women and not specifically in France.*

Rachel Shabi, "[Burkini ban: New wave of French 'mission civilisatrice'](#)", *Al Jazeera*, August 28, 2016.

*This blogger presents the French ban as driven not by secularism but by colonialism.*

"[France and the burkini](#)", *Feminist Philosophers*, August 24, 2016.

*This blog commentary makes strong points concisely. The blogger presents the ban not as a form of liberation of women but a form of coercion of women, and as punishment to a "minority group for the actions of a few individuals."*

Sheena McKenzie, "[How people around the world are saying no to France's burkini ban](#)", *CNN*, August 26, 2016.

*This article does a survey of reactions to the burkini ban, mostly mocking, including some very pointed – and entertaining! -- images and cartoons circulated on twitter.*

September 15, 2016

Is that woman really a man? Tidy categories, messy world



<https://www.youtube.com/watch?v=psxr58zKi6g>

(by Eileen Dombrowski) Swift and powerful, the athletes burst across the finish line of the women's 800 metre in Rio. The Olympics gave the world another moment of glorious human achievement as 25-year-old Caster Semenya took the gold medal for South Africa. In the background of her performance, however, controversy swirled around claims that Semenya had an unfair advantage in a women's competition – that she didn't fit into the category "woman".

The issue contentious in the Rio competition is one we confront constantly as we construct our knowledge: *how* to classify things and *whether* we can do so in a way that delineates our world neatly into categories. Classifying is basic to observing, and to the naming that enables us to share our knowledge. But what a complex world it is, often eluding the systematizing we bring to it!

### **Giraffes**

Even categories on which everyone seems to agree can grow more complex with further knowledge. Did you see that scientists discovered only a few days ago that there are actually four giraffe species, not just one? Have a look at this short video from Science Daily: [Scientists Just Realized There's More Than One Kind Of Giraffe](#)

### **Vegetables**

Even the simplest and most familiar categories of things can erupt into debate on close examination. My favourite current examples is vegetables – a category that is not biological but culinary, with plenty of variability in what it includes. Even the law has become embroiled in knowledge claims over categorization of vegetables: ["Do vegetables really exist?"](#)

When even giraffes and vegetables can challenge our classification systems, should we be surprised when our categorization of human beings founders on application to the real world?



## Women

And so – back to Caster Semenya, who has submitted to extensive invasion of her sexual identity in order to be permitted to perform in elite sports. Why is her situation relevant to Theory of Knowledge? What are the knowledge questions it raises?

### **1. Classification: *To what extent do the categories with which we describe the world reflect the world as it is, and to what extent concepts we have constructed ourselves?***

Among the many questions we could raise about classification, this one does at least invite some evaluation and comparison – for instance, categorization based on observation of natural phenomena such as rocks, bacteria, or stars, as opposed to categorization based on conceptual groupings such as historical periods and genres of literature. It's a useful question, in this case, for considering the extent to which our biological classification of sexes is supplanted by the social categorization of gender.

Certainly, the sexual identity of Caster Semenya has been at the centre of controversy. [“Could This Women’s World Champ Be a Man?”](#) questioned an article in Time in 2009 when Caster Semenya won a track and field championship in Berlin. Some of her competitors expressed strong views on her category. Italian Elisa Piccione, who came in 6<sup>th</sup>, declared, “These kinds of people should not run with us. For me, she’s not a woman. She’s a man.” The International Association of Athletics Federations (IAAF) confirmed that Semenya had agreed to testing to prove herself a woman, and thereafter cleared her to continue to compete as a woman.

But how does a person prove that she is a woman? In sports, sex-testing has centred on chromosome tests, testosterone levels, and medical examination of the reproductive system – all in order to *draw the line between the sexes*. Cheating is not the issue: Semenya’s elevated level of testosterone is natural, not a matter of taking drugs. Nor is misrepresentation an issue here: Semenya has been raised as a woman and identifies as a woman. As she won gold in Rio, she was following all the rules! The contentious issue is neither cheating nor lying but *the line itself*.

The experts of the International Association of Athletics Federations (IAAF) have acknowledged, “We must find ways to take into account that sex is not neatly divided into only two categories in the real world.” (Relevant article: [“Science will never settle the question of sex and gender in sport”](#), The Guardian)

As sporting organizations face the complexities of the real world, I can’t help adding that well into the twentieth century the category “athlete” did not include women at all! (Relevant and fascinating article: [“The Humiliating Practice of Sex-Testing Female Athletes”](#), New York Times)

### **2. Ethics: *What is meant by the ethical principle of “fairness” or “justice”, and in what ways might we apply it to the world?***

And why is it so important to many in elite sporting competitions to “draw the line” – and then to “hold the line”? The major argument centres on fairness, on a principle of justice. This principle could

generate some good discussion in a TOK class – regarding where it comes from and how “fairness” is defined.

The testosterone level of some female athletes may be an advantage to them, though apparently not consistently or extensively. So is “advantage” unfair? Does fairness demand equality in competitors -- or at least equality in opportunity? Several difficulties arise.

If we are making an ethical argument based on removing “advantage”, for instance, don’t we have to acknowledge the many forms of “advantage” that figure in Olympic competitions? What about advantages brought by wealth, such as access to training and facilities? As Sisonke Msimang comments ([“Caster Semenya is the one at a disadvantage”](#)):

In developing countries all aspects of sports are under-resourced. School programmes barely exist. Even elite athletes struggle to find a track to practice on or a coach to work with – never mind the sophisticated nutritional, psychological and biomechanical performance enhancement available to those in the developed world. Forget marginal gains, these are massive ones.

The idea that testosterone levels could constitute an unfair advantage in this climate is laughable.

What about other physical “advantages”, such as features of body structure? As Olga Khazan comments in a relevant article ([“Why Hyper-Masculine Women Are Scary, but Fish-Like Men Aren't”](#), The Atlantic)

Sports must have rules, in other words, but the Olympics are already filled with social, cultural, and biological rule-breakers. The fact that people are alarmed about the masculinity of athletes like Semenya, but not the myriad other ways Olympians deviate from the norm, suggests that our anxieties about her might be rooted in something other than a love of fairness.

In trying to frame the case of Caster Semenya or any other “masculine” woman athlete with ethical argument, we again run right into the messiness and complexities of the world, in which certain “advantages” provoke protest, while others are built right into the system.

### **TOK and the real world**

Again and again I am drawn back to comment on the topic of classification – so basic to knowledge, so significant in how we live together as human beings. If we achieve anything at all with our course, I hope *at least* that we encourage our students to combine two central IB characteristics: *critical thinking* to question the categories into which the knowledge they have received has already been slotted, and *openness* to consider alternative ways that recognize (or even embrace!) the complexities and nuances of the real world. Caster Semenya is only one example among so many human beings who elude tidy categories. But the controversy to which others have subjected her does not nullify the category that brought her so much media attention: she is one of the finest athletes in the world.

September 26, 2016

## Creativity and ways of knowing: Where do fresh ideas come from?

(by Eileen Dombrowski) Where do new ideas come from? Is it inevitable, I wonder, that in trying to talk with students about using ways of knowing creatively I'm inclined to turn to individual stories of "getting ideas"? Today I'd simply like to share two or three resources for raising discussion of creativity in class.

The first is a very short video (2:34) that uses an interview with film maker David Lynch in which he speaks about "catching" ideas.



<https://vimeo.com/182093266>

The second is an excerpt from an [interview with playwright Edward Albee](#), who died this month, leaving an impressive legacy:

[Interviewer]: When you're thinking about a play or when it's developing in your mind, even before you write it down, do you have any awareness of how it's come to you? Does it come to you as a sound or as an image or experience or all of the above? Can you trace one of your plays back?

Albee: I'm not a didactic playwright, consciously anyway. I don't sit around and suddenly decide, gee, now I've got to write a play about this or that. No, I don't do that. I will discover one day when I'm wandering about, theoretically minding my own business, that a play is forming in my head. How do I know that? Well, there's some characters talking, or a visual image occurs to me, which makes me realize that something is happening in my head....It's usually fleeting or I'll be at a recital listening to a pianist or a string quartet and all of a sudden I will start hearing people talking or getting the sense of some other reality taking place.

The characters I write, all of our characters, we playwrights, all of our characters come – we either use ourselves or people we know or we invent. Better to invent, because if you base a character on somebody you know or a real person, you're limited by how that real person would respond. And so if you invent the character, you can do any damn thing you want. You

can have them behave the way you want them to. So for the most part, I invent or think I do anyway. And I let them talk.

Both of these artists are commenting on *getting ideas* -- not on what they do ultimately with them. For instance, Edward Albee, while denying in this interview that he is didactic, has [elsewhere commented](#) on the social responsibility of the playwright: "All plays, if they're any good, are constructed as correctives...That's the job of the writer. Holding that mirror up to people. We're not merely decorative, pleasant and safe." The creative shaping of a play, with the author's sense of purpose, does not stop with the initial generation of a good idea.

### Knowledge questions

Short and engaging, these two quick clips of artists are probably enough to fuel questions for students on **what ways of knowing are involved in creativity**. What ways of knowing give David Lynch the "fish" to catch? What ways of knowing give Edward Albee the knowledge of how people talk and act, as characters take on life in his mind? And then, what are the roles particularly of *intuition* and *imagination*, those most frankly alluring of our ways of knowing? To what extent does artistic *intuition*, if it is to fuse pre-conscious connections that are insightful, depend on prior knowledge gained through other ways of knowing such as the observation enabled by sense perception -- or memory -- or emotion? To what extent does *imagination* (such a glorious way of knowing!) take its raw material from knowledge gained otherwise?

For discussion of creativity, I'm inclined to encourage students in anecdotes of their own about getting ideas. If they are ready to talk about their own experiences of painting, writing, composing or playing music, then you have more class examples to draw on for further questions -- on **whether we can generalize about creativity**. We can certainly generalize about *methodologies* of different areas of knowledge, but to what extent does the generation of fresh ideas elude generalization and prescription?

I wouldn't like to leave creativity, though, as the province of artists; we'll want to consider **what the role of creativity is across other areas of knowledge as well**. The TED video "[How simple ideas lead to scientific discoveries](#)" (7:32) gives a couple of fine examples of scientists getting ideas -- creative ideas not just about *how things are* but also about *how to find out*. The methodology of the natural sciences provides a means for filtering out those creative ideas that don't turn out to accord with the facts. And the testing methods themselves can be utterly ingenious! The ones in this TED video amaze me. I wonder...could methodologies developed to test creative hypotheses for their accuracy -- developed, in effect, to discard them if they fail -- be considered to be likewise the product of creative thinking, itself then tested? Isn't the method of science itself a result of creative genius?



Adam Savage:  
**How simple ideas lead to scientific discoveries**

[https://www.ted.com/talks/how simple ideas lead to scientific discoveries](https://www.ted.com/talks/how_simple_ideas_lead_to_scientific_discoveries)

### And other stories?

Today, as I share three short resources for prompting discussion of creativity in class (supplementing ones already in the OUP [TOK Course Book](#)), I'm very aware that these ones are simply individual stories taken from so many that are possible. If you have a favourite story that you'd be willing to share, would you consider adding a comment to this post?

Ever since Edward Albee died last week, I've been thinking myself about writers who have truly contributed to what and how we think. As I start reading a new Booker-winning novel this rainy afternoon, I'm feeling so grateful for what they have created. I confess that I find the *creation of knowledge* utterly fascinating, even though it can be more slippery to discuss than the conscious methodologies that guide and test knowledge.

### AND A PS

[Quotation from revered filmmaker Akira Kurosawa](#), linking creativity with reading and memory: **"Unless you have a rich reserve within, you can't create anything. Memory is the source of your creation. Whether it's from reading or from your own real-life experience, you can't create unless you have something inside yourself."**

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October 10, 2016

Creativity: arts and sciences



<https://youtu.be/BQ4UwzRLVpQ>

(by Eileen Dombrowski) As a PS to my previous post on creativity and ways of knowing, I'd like to add a short (3:44) video clip of scientist Neil de Grasse Tyson speaking of the importance of the arts.

In the context of defending the arts from funding cuts, his appreciation of creativity and culture, embodied in the arts, gains the energy of argument. The importance of BOTH the sciences AND the arts may be self-evident to those of us teaching TOK -- as indeed to most scientists and artists. Yet the faux-competition between these two areas of knowledge is one of those zombie ideas that just....won't....die!

These ideas are expanded in the following article, with the inset discussion on the sciences, arts, creativity, and the brain -- very interesting and potentially useful for exposing students to living -- [not zombie!](#) -- ideas.

October 24, 2016

"I'm entitled to my opinion."



Right to an Opinion by [Michael J. Hildebrand](#)

(by Eileen Dombrowski) "That's what I think. And I'm entitled to my opinion." This kind of declaration can be the end of the road for any exploration or exchange of ideas. Up goes the wall. Behind it, the speaker entrenches a view and refuses to examine it. In a course such as Theory of Knowledge where we encourage students to think about *justifications* for reaching conclusions and to *reflect* on what they think themselves, the assertion that "It's my right to have any opinion I like" runs us smack into opposition to any thought whatsoever. Given our goals of reflection, analysis, and communication, how can we handle this barrier to thought if faced with it in class?

We can certainly witness what happens in the media, with Brexit and the American presidential campaign flooding us with more examples than we ever wanted of entrenched opinions impervious to examination. In news reports and media commentary, we watch the walls of opinion go up, and behind them we hear the sabers rattling.

Is it possible that in TOK we can discuss ideas in a way that's different from the public contest we witness? Can we encourage in our students a way of thinking that would enable them to navigate conflicting knowledge claims more thoughtfully?

How might we do so? No teaching methods are ever fool-proof, and no group of students is completely predictable in their reactions. Still, in large part I think we can forestall the "It's my opinion, and that's that!" wall from going up by:

- establishing open questioning from the beginning
- introducing vocabulary and distinctions that give students a way of steering around obstructions in the way of communication
- creating a safe and inclusive space in class
- valuing opinions and encouraging their thoughtful development

But as I express my own opinions here, I appeal to experienced TOK teachers: are these approaches appropriate or even obvious – in your opinion? Can you offer suggestions that – in your opinion – work effectively to keep communication flowing even while views strongly differ?

### **1. Establish openness and questioning right from the start.**

In the [TOK Course Book](#) I suggest opening TOK by questioning the whole point of the course ahead. Some lighthearted materials prompt initially broad discussion on the question “**Does it matter if what I believe is true?**”

Today, I’d be tempted to substitute the question “**Are people always entitled to their own opinion?**” -- just because it raises the same points, but in a way that immediately connects TOK with everyday debate. And then I’d give students the chance to think and comment themselves on what the question actually *means* and what provisions they might impose on agreeing with it.

I’d expect, with a group of IB students, that some of the following distinctions would emerge:

- the “right” to having your own opinion vs having an opinion that is “right” (The concept of “rights” can be flagged for later discussion on ethics.)
- entitlement to *having* an opinion vs entitlement to *acting* on an opinion in society, or even *expressing* the opinion if it is hate speech
- accepting someone’s opinion vs treating that person with respect whether you accept his opinion or not
- whether all opinions are of equal value, or whether some opinions are worth more than others (Aha! The term “justification” can be introduced and hopefully some early discussion on what it involves.)

I recommend an article by Patrick Stokes, lecturer in philosophy, entitled “[No, you’re not entitled to your opinion.](#)” I wouldn’t, however, take his classroom approach of declaration. I’d try to get students to think through the issues and make the points themselves.

### **2. Help students distinguish different kinds of knowledge claims and their appropriate justifications.**

As a follow-up to the discussion above, I’d prepare a sheet of 5 to 10 assertions of opinion (knowledge claims) ready to circulate in order to pin down *analytically* some of the distinctions that are likely to have emerged.

If students haven’t distinguished already between facts and values, or between facts and interpretation, a list like this one could give them a push. This is just a sample – and if you opt for an activity like this one, you’ll probably want to generate your own assertions that are more likely to galvanize your own group.

#### **Sample knowledge claims “It’s my opinion that...”**



*Which of the following knowledge claims would you call “opinions”? If some are opinions, and some of them are not opinions, what is the difference between them?*

*What is the difference between a “fact” and an “interpretation”? What is the difference between a factual statement and a statement of values?*

1. I think Usain Bolt is the finest athlete in the world.
2. I think that the Treaty of Versailles was signed in 1919, ending World War I.
3. I think all children should have access to free basic medical care and free basic education.
4. I think all people should pay for their own education and medical care and not ask the government for help.
5. I think that the Treaty of Versailles was signed in 1920, as the document which founded the League of Nations, a forerunner to the United Nations.

In the *TOK Course Book* I’ve followed a common distinction by dividing knowledge claims into different kinds: statements of observation, statements of values, predictions, hypothetical statements, metaphysical statements, and definition. Although the different kinds of knowledge claims are interconnected in any arguments we’re likely to make, drawing these distinctions is useful for any kind of clarity. In many ways, these distinctions underlie our whole course.

Sadly, some commentators have called recent years the “post-fact era”, when factual statements established on the basis of considerable evidence by an appropriate method and a relevant expert are treated in the media as if they can be debated in the way statement of values can be. It takes more than a distinction and a definition to get students to recognize what “facts” are, even with all their uncertainties. We have some fascinating territory to explore in the short hours we have for teaching TOK!

### **3. Create a safe space.**

We don’t want students to retreat behind the “It’s my opinion” wall and shut off their thinking altogether. But there are many reasons for students to put up a wall, and not all of them involve mental laziness. We want to create an atmosphere where they don’t feel they need to retreat to protect themselves.

We can **set the tone**, and maintain it, so that students treat each other with respect – listening to each other and letting others finish, being polite even in disagreement, and asking questions about others’ views rather than just assuming they already know them. I’ve known some teachers who work out ground rules for discussion at the beginning of the course with their students and find them helpful to guide the class. We can also allow that students sometimes need to disengage from discussions on particular topics because of personal comfort level at the time, and uphold their “right to their own opinion”. From time to time, they may need a wall – and are more likely to let it down for discussion later if they feel in control.

We can **set the pace** in discussion so that students don’t feel out of their depth too often and begin to retreat behind that wall. Sometimes students find ideas too unfamiliar, or feel that they contradict

what they think already -- but they can't process the ideas on the spot or formulate questions or comments immediately. I've found it helpful to give students a question in advance on which to gather their thoughts – a few minutes in class to find their ideas and their words before they enter discussion, or perhaps some time at home after a discussion to pull together their ideas for themselves.

We can ***vary class styles of communication*** to keep that wall from going up. It's great fun to have energetic class exchanges where lots of students want to jump in with ideas, but it's too easy to ignore the students who remain quiet. Quiet students may be happily engaged as they follow discussion – the amount of mouth noise people make is certainly not a reliable indicator of amount or quality of thought! But it's also possible that they feel excluded or inadequate. With a range of personalities in our classes, we have to balance group discussion with small group work, pair work, and individual reflective writing to make sure that everyone's communicative comfort is taken into account.

Wouldn't it be a transformation if all groups in society or at work aimed to be communicative, respectful and inclusive? I keep hoping that familiarity with an open, questioning, supportive space in class will have lasting effects on our students when it's their turn to run the world!

#### **4. Give value to the concept of “opinion” and the responsibility for forming one thoughtfully.**

In TOK, we're not out to make our students agree with our opinions.

Instead, we're out to help them to listen to different points of view and recognize why people hold different perspectives, even if they disagree. We're out to help them recognize and evaluate the *justifications* that people put forward for their knowledge claims and their arguments.

*In my opinion*, we're perfectly positioned in TOK to facilitate communication across cultures and worldviews and to support conflict management or resolution. We're also centrally placed to foster appreciation of how areas of knowledge hone their knowledge claims and validate their experts and “expert opinion”.

In TOK we have a lot to offer in public context where people too often put up walls to communicating with others unlike themselves, and see the other side of the wall as alien or threatening. At least, that's my opinion.

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November 7, 2016

## Is Palestine on the map?

(by Eileen Dombrowski) Is it surprising that in Theory of Knowledge we are drawn to an analogy between the MAPS different people have made of the world and the KNOWLEDGE they have constructed of it – with all the selection, interpretation, and representation both demand? Is it surprising that critical reading of maps needs the same recognition of perspectives that we apply to language as a way of knowing?

[A recent article in the Science section of The Guardian](#) gives us a striking contemporary example of maps being used to express and support a political perspective. “The issue caught fire,” writes Petter Hellstrom, “after the Forum of Palestinian Journalists accused Google of removing Palestine from their maps.” Hellstrom treats the absence of Palestine from Israeli maps in the context of political choices that have always influenced cartography:

drawing a map always involves choices, whether they are reflected or not. In the conflict-ridden Middle East, those choices are often blatantly political. The official map of Israel, [available on the web page of the Israeli government](#), integrates the occupied territories into Israel and is devoid of any Palestinian place-names. Conversely, Palestinian maps often label the whole country as Palestine – effectively a refusal to acknowledge the development since 1948.

The Palestinian example is particularly striking in that it is more than a dispute over the position of borders: on the Israeli map, the country *doesn't exist at all!* Hellstrom similarly cites American colonial maps which don't merely give a version of land claims on Indian territory: they give no indication that indigenous people *existed at all*.

For border disputes involving, more conventionally, just where the line is drawn, he links to the project ["Disputed Territories"](#), which gives the viewer versions of map boundaries (e.g. Crimea, Jammu and Kashmir, and islands in the South China Sea claimed by five countries) as seen on their internet by people from different countries.

In the [TOK Course Book](#), I've included maps in the chapter on *language as a way of knowing*, along with statistics, and photographs, and I've offered activities for students to recognize and practise some analysis of key factors: selection, emphasis, colouring, and framing. This article by Petter Hellstrom supplements very well the activities and examples raised there.

For a more upbeat angle on world maps, though, you might share my huge delight in a new one which just won a Japanese design contest: ["A More Accurate World Map Wins Prestigious Japanese Design Award"](#). Not only is it a refreshingly different attempt at accuracy, but it also comes with a twist. No, not just a twist. *A fold*. Lots of folds. Check it out -- from the country that brought us origami!

## Resources

Petter Hellstrom, "Not on the map: cartographical omission from New England to Palestine", *The Guardian*. August 22, 2016. <https://www.theguardian.com/science/the-h-word/2016/aug/22/not-on-the-map-cartographic-omission-history>

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November 21, 2016

Thinking beyond the knowledge bubbles



(by Eileen Dombrowski) I'm taking a little holiday from watching the news. I do this sometimes. I turn off the volume to watch all those mouths move, then let all of the frustrated and angry people float away, sealed in their lovely bubbles. Escapism? Yes – and no. Sometimes it's the only way to imagine myself outside my own bubble of news and views, to try to see how people get

sealed off from each other in their internally coherent mini-worlds. If I quiet my own rage at the world and stop myself from yelling about "truth", I think I can see that the people inside all the bubbles are a lot alike, and are using similar ways to create their different versions of the world. It's those ways that grab my attention for Theory of Knowledge. The following story is likely to grab *your* attention as well.

Three reporters ran what they called an "experiment" in news consumption during the recent American election. Although in TOK we might reserve the term "experiment" for a foray into knowledge constructed more rigorously, they did gather some gripping stories of the power of filters in social media to reinforce what people believe already. As we know, in the intuitive cognitive bias known

as *confirmation bias*, we are inclined to accept what is in harmony with our thinking and reject what jars with it, without even being conscious that we're doing so. OK. Got it. This isn't new. But would we expect our own biases to *affect the technology* you use to get access to information? Isn't the internet neutral, just the product of an objective machine?

### **Contradictory communities: versions of the world**

I recommend this account of their "experiment" in Facebook bubbles, simply because one of the most effective ways of opening an issue for students is to use stories – to catch interest with human responses and then move to the larger knowledge questions. I like this particular article because it humanizes sympathetically both the people who hold left wing perspectives and the people who hold right wing perspectives. It suspends questions of who is right and who is wrong in order to look at *how they are receiving their information* – and how they are channeled by their initial political perspectives into self-reinforcing flows of information: ["Bursting the Facebook bubble: we asked voters on the left and right to swap feeds"](#).

Recognition of the bias built into algorithms on the web is not, of course, Breaking News. Indeed, the term "filter bubble" seems to have worked its way into our language. Yet our students, digital natives though they be, may never have thought critically about what the web offers them as they take their information and perspectives from it. Clair Cain Miller, [writing in the New York Times in July 2015](#), argues that "algorithms discriminate":

There is a widespread belief that software and algorithms that rely on data are objective. But software is not free of human influence. Algorithms are written and maintained by people, and machine learning algorithms adjust what they do based on people's behavior. As a result, say researchers in computer science, ethics and law, algorithms can reinforce human prejudices.

It is certainly useful to have google do the sifting for us to prioritize the sorts of articles we like to read, as our past preferences influence our future options. Yet the bubbles we are building around ourselves, as contrary perspectives and unsought topics increasingly fall away, carry serious implications. For instance, right after the Brexit referendum in the UK, British internet activist Tom Steinberg posted [the following urgent message](#) on Facebook as he tried to burst out of his own bubble of exchange of news and views:

I am actively searching through Facebook for people celebrating the Brexit leave victory, but the filter bubble is SO strong, and extends SO far into things like Facebook's custom search that I can't find anyone who is happy \*despite the fact that over half the country is clearly jubilant today\* and despite the fact that I'm \*actively\* looking to hear what they are saying.

This echo-chamber problem is now SO severe and SO chronic that I can only beg any friends I have who actually work for Facebook and other major social media and technology to urgently tell their leaders that to not act on this problem now is tantamount to actively supporting and funding the tearing apart of the fabric of our societies. Just because they aren't like anarchists or terrorists - they're not doing the tearing apart on purpose - is no excuse - the effect is the same, we're getting countries where one half just doesn't know anything at all about the other.

It's in the power of people like Mark Zuckerberg to do something about this, if they're strong enough and wise enough to swap a little shareholder value for the welfare of whole nations, and the world as a whole.

As this Facebook example suggests, awareness of the problem is *necessary* for viewers to want to burst out of their own bubbles but not in itself *sufficient* to counter the problem. (Steinberg identifies the problem, but may still be trapped in there, calling, "Let me out!")



### Should TOK bother with bubbles?

So what can we do about it? Is this a problem relevant to the Theory of Knowledge course? I'd say, most definitely, YES.

**First**, understanding the role of perspectives in knowledge is central in three of the five TOK course aims, as given in the IB Theory of Knowledge Guide. In our course, we aim that students will:

- develop an awareness of how individuals and communities construct knowledge and how this is critically examined
- develop an interest in the diversity and richness of cultural perspectives and an awareness of personal and ideological assumptions
- critically reflect on their own beliefs and assumptions, leading to more thoughtful, responsible and purposeful lives

**Second**, the concept of truth still has some meaning in Theory of Knowledge as an ideal and a goal, even if the word and the concept are a bit shop-worn in an era that has been repeatedly called "post-truth" in the media. Students benefit from looking closely at how the word is flung about, and seeing what's discarded from knowledge if "true" is accepted to mean "true-for-me". As Katharine Viner comments in ["How technology disrupted the truth"](#),

Twenty-five years after the first website went online, it is clear that we are living through a period of dizzying transition. For 500 years after Gutenberg, the dominant form of information was the printed page: knowledge was primarily delivered in a fixed format, one that encouraged readers to believe in stable and settled truths.

Now, we are caught in a series of confusing battles between opposing forces: between truth and falsehood, fact and rumour, kindness and cruelty; between the few and the many, the connected and the alienated; between the open platform of the web as its architects envisioned it and the gated enclosures of Facebook and other social networks; between an informed public and a misguided mob.

What is common to these struggles – and what makes their resolution an urgent matter – is that they all involve the diminishing status of truth. This does not mean that there are no truths. It simply means, as this year has made very clear, that we cannot agree on what those truths are, and when there is no consensus about the truth and no way to achieve it, chaos soon follows.

Increasingly, what counts as a fact is merely a view that someone feels to be true – and technology has made it very easy for these “facts” to circulate with a speed and reach that was unimaginable in the Gutenberg era (or even a decade ago).

Students benefit, I’d say, from recognizing that there are different approaches to the search for truth:

- an approach based on **pragmatism** that accepts what “works” (works for whom?),
- an approach based on **coherence** that depends on the internal harmony of information and interpretations (bubbles of agreement, no contradiction allowed!), and
- an approach based on **correspondence** between knowledge claims and the world.

The approach through correspondence may be the only way to test knowledge claims with evidence and try to get outside the bubble-effect of an approach based on internal coherence, as people within bubbles agree with each other and circulate only information that is in accord with their views.

**Third**, TOK has to tackle the bubble-effect – of both technology and our minds -- if it is to teach critical evaluation of knowledge claims *at all*. HOW do we take the approach of finding the best justifications – the best evidence, the best reasoning – for factual claims? HOW do we find the best justifications – the best arguments, the most thoughtful understanding – for claims of values? It’s not easy if the information most readily accessible is inaccurate, pre-selected, or heavily interpreted with emotions and values. Students need to be given awareness and taught some skills.



## We can do it

Nevertheless, in Theory of Knowledge we are right on track to give students the awareness and the critical skills they need.

As we teach how **ways of knowing** work, we can engage students in reflection and critique on their use and interaction, stressing how to use them critically ourselves and to recognize their critical use by others in society and in areas of knowledge. As we deal with the concept of "shared knowledge", we can encourage them to recognize *how* knowledge is shared – and see the pitfalls in the flow of knowledge. I consider it essential that students gain an understanding of how we use intuition and reasoning, for instance, and how emotion affects sense perception, language and memory. It is very effective to tie the ways of knowing to recognition of common errors – common fallacies and cognitive biases.

As we teach how **areas of knowledge** work, we are reinforcing every basic critical skill. We are introducing students to ideas of *methodology* – or in other words, of the expectations within each area of knowledge for the best practices and procedures of thinking critically. We are introducing ideas of conscientiously making knowledge claims that are true (to the best of our knowledge!), being self-critical, sharing knowledge in a way that is open to group scrutiny, and being willing at least to *try* to break out of interpretive bubbles to understand an alternative way of thinking.

In our efforts, we have the cooperation of our colleagues as they, in their own classrooms, are sharing our goals of making students understand and appreciate how knowledge is constructed. As we deal with large overview concepts of how knowledge is constructed in their areas, *they* are tackling the close-up applied topics of research and findings, methods and results. They are dealing, in different ways according to their fields, with topics of methodological care and responsibility. Can we encourage our students to apply some of this to their everyday google searches and consumption of social media and news?

As teachers, we are all in the position to help students deal with the information bubbles that surround them in social media, and to engage with two topics whose **knowledge questions** are urgent to explore:

**perspectives:** How do we recognize, understand, and evaluate different perspectives as we consider their influence on knowledge?

**sources:** How do we know what sources of information to accept as most reliable on particular topics? On what bases are organizations, publications, or individuals treated as expert sources?

These are central knowledge questions for both areas of knowledge and everyday knowledge of the wider world.

Without importing into our classrooms the strident antagonism of conflicting perspectives, can we make our students aware of the extent to which people who share a community can be living, in their minds, in mutually contradictory versions of it? Can we alert them to the need to check out the biases



and bounds of their own sources of knowledge and encourage them to be sympathetic to others who, like themselves, are believing what they are told by sources they've accepted as reliable? I believe, to a significant extent, we can.

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November 28, 2016

Oh, that air of authority!



(by Eileen Dombrowski) All the form without the content! I leave it to you to formulate the appropriate knowledge questions -- about persuasive devices, about experts and authorities. I'm too busy laughing!

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December 12, 2016

## Is mathematics a gateway to empathy?

(by Eileen Dombrowski) Is the study of mathematics *really* a gateway toward empathy? I'm not fully convinced by the argument [presented by mathematician Roger Antonsen](#), but I like him for making it. We need all the empathy we can get in our world. Certainly, his mathematical visualizations *do* demonstrate the importance of mental flexibility and imagination in mathematics, and *do* stand metaphorically for being able to see from different points of view. And his argument leads to some interesting knowledge questions about perspectives and empathy.

His TED talk is useful to TOK teachers, first, in linking mathematics with *ways of knowing* – with *WOK language* and *WOK imagination* – and in giving to numbers a delightful visualization that even students not enamoured with mathematics will likely find fresh and interesting.

Antonsen's talk is even more central to TOK, though, in his central argument that reconceptualizing patterns within what we see and represent is fundamental to understanding. He uses different versions of representing mathematical numbers and relationships just as many TOK teachers use optical illusions within a treatment of *WOK sense perception*: that is, he uses them as a metaphor for thinking freshly, seeing differently, and recognizing the different possibilities for understanding within the same representation. Taking a stance as a teacher, he comments on consciously using metaphors as a teaching tool, and specifically on using the variations in mathematical representations as a metaphor for *changing perspectives* – and thereby understanding more fully. "My claim," he says (11:02) is that you understand something if you have the ability to view it from different perspectives."

Yet, for me, the weakest part of his argument is actually the most appealing part of the talk – and it's the part that would persuade me to offer this 17-minute TED talk to a TOK class for discussion. I never like to use materials in class that are so tidy and complete that students are left with nothing to question or add. It is Roger Antonsen's claims near the end (15:40) that, for me, lift the talk from being *merely* a useful class video on mathematics into being a provocation for reflection and discussion based on it:

Mathematics and computer science are the most imaginative art forms ever. And this thing about changing perspectives should sound a little bit familiar to you, because we do it every day. And then it's called empathy. When I view the world from your perspective, I have empathy with you. If I really, truly understand what the world looks like from your perspective, I am empathetic. That requires imagination. And that is how we obtain understanding.

I would follow up the video, after due applause, with a couple of questions that invite comparisons across our areas of knowledge:

### 1. "perspectives"

How does Antonsen use the term “perspectives” here? What does a change of perspective involve for him? How might his metaphor apply to the natural sciences, history, or ethics? What else – or what more – would you expect from a shift of perspective in these areas?

**(Larger knowledge question:** How do differing perspectives affect knowledge?)

## 2. “empathy”

What does Antonsen mean by empathy? What ways of knowing do you think are most involved in the creation of empathy -- others besides imagination? If imagination is *necessary*, does that mean that it is *sufficient* to achieve understanding and fellow-feeling? To what extent do you think empathy follows from a flexible mind in mathematics? Are there other areas of knowledge to which you are more likely to turn for the development of empathy? In what ways is empathy relevant to your IB education as a whole?

**(Larger knowledge question:** How do ways of knowing contribute to – or interfere with – understanding different perspectives in areas of knowledge?)

Myself, I wouldn't expect mathematics to do all that Antonsen claims – and I'd say that empathy requires more than solely being able to *think* from a different point of view. I'd say it requires emotional openness to supplement the imagination (*WOK emotion*), and often some background information to be able to understand people emerging from very different life circumstances. Yet I like very much his emphasis on cultivating mental flexibility and the capacity to re-imagine things otherwise. These we badly need – not just in our classrooms but also in our world.

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**...and that's it for 2016!**

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