

# Language Barriers between Scientific Community and the Public

It is no secret that there are language barriers that exist between the scientific community and the public, but what is not so commonly known is what factors have created these language barriers and the effects that these language barriers are having on our society. One of the more obvious reasons of why these language barriers exist is due to the fact that the language used in the scientific community is so different than the language used in the public. No, scientists are not speaking a different language all together, but they are using terms that are specific to their area of study. These words, terms, and acronyms are so unique to that area of study that another scientist from a different field normally has no idea what any of the words/acronyms mean. Most scientists are aware of these barriers within their own communities, but very few are actually taking steps to break apart these barriers. An example of a scientist who is well aware of these barriers, and is actually taking steps to breach these barriers is [Marcus du Sautoy](#). Sautoy is the professor for Public Understanding of Science and a professor of Mathematics at the [University of Oxford](#).



Professor Marcus du Sautoy

He believes that the language barriers between different sciences is “partly due to the time and hard work we put into our own specialist subject meaning there often isn’t time to see what’s happening in other areas” (Jackson). In efforts to resolve this problem Sautoy organizes discussion groups and regular podcast debates in all four areas of science, and humanities. All professors of these departments participate in these activities and Sautoy claims that many lessons have been learned though doing this. He claims that breaking these barriers is “about thinking in a different way, learning about what each other do and going out of the normal comfort zone to get into the mind-set of another scientist. It is through facilitating the contacts between disciplines and departments which I think will create the big breakthroughs in science as we go into the next decade”. I strongly believe that what Sautoy is doing will help break down the language barriers between the different fields of science, and will lead to better scientific understanding, new breakthroughs, and more advanced technology (Jackson). However, when these breakthroughs are made, how will the scientists get past the language barriers that exist between the science community and the public? So far we have addressed the language barriers that exist within the scientific community, but what about the language barriers between the scientific community and the public? Based on my research I have found that there are two primary causes for the language barriers that exist between these two communities.

1. The use of words, terms, and acronyms that is far beyond the understanding of the majority of the public.
2. Unrealistic expectations that the public holds regarding the scientific community.

During my research I came across a perfect example of the differences of the language used between members of the same scientific specialty, and between that scientific community and the public. The example comes from a finding from [Nathan](#)

[Sanders](#), a PHD student at [Harvard University](#). Sanders was studying supernovas and was lucky enough to see one, here is how he explain the experience to the public:

*“A star exploded in a galaxy not so distant from our own and our telescope just happened to point at that galaxy right after it happened. As the evidence of this stellar catastrophe—a supernova—waited patiently in the images on our hard disks, the explosion steadily grew in brightness. The supernova became twice as bright, then four times as bright, then ten times as bright as it was when we first imaged it. At this point, a week later, it was as bright as any explosion we’ve ever seen from a massive star. This is the point—peak brightness—when supernovae are usually discovered, and indeed another group found it in their own images from this period. A third group performed optical spectroscopy on the supernova and determined that it was of a rare type, thought to be produced from the death of a massive star which gives way to a black hole. But what makes this supernova truly remarkable, different from almost any of the thousands of others that astronomers have observed over the past century, is that it kept getting brighter. It doubled in brightness again, and then doubled again!”*

However, this is not how he his discovery to his colleagues in Astronomy, this is:

*“We report on our serendipitous pre-discovery detection and detailed follow-up of the broad-lined Type Ic supernova (SN) 2010ay at  $z = 0.067$  imaged by the Pan-STARRS1  $3\pi$  survey just  $\sim 4$  days after explosion. The SN had a peak luminosity,  $M_R \sim -20.2$  mag, significantly more luminous than known GRB-SNe and one of the most luminous SNe Ib/c ever discovered”*  
[\(Scientific American Blog Network, Sanders\)](#).

I believe that in the first description Sanders does a very good job at making the discovery make sense to just about anyone, sure that person won't have the background knowledge

required to know why this is so spectacular, but they would at least get the general idea of what happened. Unfortunately, this is not normally the case of how most scientists describe their discoveries, their descriptions normally resemble the description Sanders provides to his colleagues. This is because scientists are often not consciously aware of the background knowledge, knowledge of the subject, and knowledge of the subjects vocabulary that their audience has. This causes the scientist to use acronyms and terms that the public doesn't understand. Which then causes great confusion of what is happening, and what this discovery means for society. It could also be argued that situations like these are cause for the general publics loss in interest in what is going on within the scientific community. To fix these problems and reduce the language barrier, it is crucial that the scientist knows exactly who the audience is (Arola 23) and delivers the information to them in a way that will aid their understanding of the discovery, hypothesis, or situation. On the other hand, not all of the blame for these language barriers can be placed on the scientific community, the public is at fault too. Due to the publics lack of knowledge on exactly where we are at with scientific technology, and the capabilities of scientists to make predictions/hypothesis based of the data given, the public holds unrealistic expectations of scientists capabilities, and the accuracy of their predictions/hypothesis. This is very true for geologists, but examples of this can be found with any scientist. This is so true with geologists because geologists, along with other scientists, are the ones who have to predict when large earthquakes, or volcanic eruptions, are going to occur. There is no current way to accurately predict when either one of these natural disasters will occur, they can only hypothesize by using technology, such as seismographs. Seismographs allow scientists to measure, and record, tremors/shifts that are taking place in the earths crust. There are signs that Mother Nature gives off that show geologists that an earthquake might happen, but determining the exact time and location of this

earthquake is not yet possible, same thing goes for volcanic eruptions as well. With that being said, you would think that the public would be aware of scientists capabilities of predicting these natural disaster and would not try to hold scientists for not being able to fully predict when and where one might occur, guess again.



Damage after earthquake in L'aquila

In L'aquila, Italy (2009), seven scientist were initially found guilty on charges of manslaughter after not fully being able to predict an earthquake that took three hundred lives. The defendants, all prominent scientists or disaster experts, had been accused of giving "approximate, generic and ineffective" advice about whether small tremors in the area in the weeks prior to the 6.3-magnitude quake should have alerted them to the probability of a major seismic event. This caused an uproar in the scientific community all across the world, and rightfully so. There was no way that the scientists could have predicted the earthquake, although there were small tremors in the weeks before the big quake, small tremors have not been proven to be a sign of a bigger quake that will occur. Also, when the public tries to go after scientists that delivers a clear message to the rest of the scientific community, and that message is to not give your advice on natural disaster because if you end up being wrong, you will

be penalized in a very unjust way (Squires). Two years after the seven scientist were found guilty on manslaughter charges, with six years in jail, six scientists were acquitted of their charges. The 7<sup>th</sup>, Bernardo De Bernardinis, was charged because the court found that there was evidence that tied his advice to the decisions of 29 people, who died in the earthquake, to stay inside. Bernardinis had advised locals to sit back and enjoy "a nice glass of Montepulciano" wine (Squires). Bernardinis sentence was cut, from six years to two years.

Through the duration of my research I have been able to conclude:

- There are definite language barriers within the scientific community throughout the different specialties, as well as between the scientific community, as a whole, and the public.
- Server effects are taking place on our society as a result of these language barriers.
- More research needs to be done to accurately determine what the exact cause and effects of these language barriers are. After the research that I have done, my position is:
  1. Unrealistic expectations, as well as uncertainty of certain terms, words, or acronyms, has resulted in the language barriers between the scientific community and the public. The high demand of time for ones own specialty results in the sparse amount of time for scientists to become familiar with other specialties, and the terms, word, and acronyms that are associated with those specialties.
  2. A lack of technological/scientific advancement has been a result of these barriers, along with a loss in trust/interest in the scientific communities.
- This situation is much more complex than originally anticipated, more research needs to be completed to

become fully educated on this subject.