

“When the only tool you have is a hammer, all problems begin to resemble nails”

(Abraham Maslow). How might this apply to ways of knowing, as tools, in the pursuit of knowledge?”

Word Count: 1588 Words

There are dozens of tools in a carpenter’s workshop . Screwdrivers, saws, hammers, mallets, wrenches, spanners – the list goes on and on. The variety is almost overwhelming, and a single all-encompassing tool would be ideal. It seems as though Reason is to Mathematics what a hammer is to a nail –a perfect partner, but can a single way of knowing fully address an area of knowledge? Also, is a hammer useful when dealing with screws and nuts and bolts? That is to say, how effective is a single way of knowing in multiple areas of knowledge? The ways of knowing we are equipped with are extremely powerful tools, but some are more powerful than others. In this essay, I will investigate the efficacy of Reason as a way of knowing in the field of Mathematics and the Arts, and compare it to the capabilities of Emotion in Ethics and the Natural Sciences to see if it is possible for a single way of knowing to replace the entire toolbox.

Reason plays a role in our knowledge of Mathematics and the Arts, but to different extents and in different ways. Reason and Mathematics almost seem as if they were made for each other - We have unconsciously been using reasoning in Mathematics since we were in kindergarten, using deduction to make something useful out of the information we have, structured around the premises we believe to

be true. We can rely on our reasoning as long as the logic is sound and our premises are true. In Mathematics, we are fairly confident that, for all practical purposes, our axioms are true - or at least they are universally accepted, and so reason can be used effectively. Our reasoning can help us to navigate through the landscape of mathematics. We could say that $4 \times 9 = 36$. This statement follows some sort of logic or order in our minds. However, I would argue that the result is not all that significant. The result may be more practical in a particular situation, but it isn't necessarily more meaningful than the question. Reason can be used to get from one point to another in mathematics, but it does not address the full scope of mathematics. Often, just reasoning may be sufficient to complete the task at hand, when it involves mathematics in its most superficial, conventional sense (say, answering a question in a mathematics exam), but the role of other ways of knowing in mathematics cannot be ignored. We can use reason and knowledge of our axioms to figure out that $\log_e(e^7)$ is 7, but conceiving the notion of logarithms in the first place, "A quantity representing the power to which a fixed number (the base) must be raised to produce a given number"ⁱ as a means of simplifying calculations - would have required an element of creativity and imagination. When I look at a question on my maths exam, I know there are several ways to approach it, some long-winded, some straight forward, but my intuition guides which one I choose. Thus, in mathematics, while reason plays an integral role in our knowledge and processing, it is supplemented by other ways of knowing. Mathematics requires the support of creativity to spark mathematical concepts, and intuition to guide processes along the optimal path, without which mathematics would lack direction and would likely be a series of logical, but fruitless steps.

Reason plays a smaller role in the arts than it does in mathematics. Using Reason in the Arts is slightly unconventional, but not impossible. However, its scope is limited, because of the nature of the axioms in use. The arts can deal with self-expression, or reflect contemporary society, or be used as a means of expressing moral or political opinion and so much more. The knowledge we seek in the arts is perhaps more abstract than knowledge in mathematics, and so the precise nature of answers that reasoning provides may be of limited use. Furthermore the premises upon which we base our reasoning on are usually highly subjective and we certainly can't come to universally accepted axioms the way we are able to in math in order to reach meaningful conclusions. Attempting to use reason to gain knowledge about art when there are no universally true (or at least, agreed upon) premises to base our reasoning upon is like trying to build a house on water – No matter how well structured the building is, it is not going to stand on shaky ground. Reason may not be the most effective way of knowing the field of art, its utility perhaps eclipsed by other ways of knowing such as emotion. I assess the value of a piece of music based on its emotional appeal. My favourite song is "The Gambler" by fun. which tells the story of the lead singer's parents' romance. The content of the song is not easily relatable maxims about life and love - instead it follows a very specific narrative filled with details of their lives, which has no relevance to me. Try as I may, I cannot find a reasoned explanation as to why I like this song. But lines like "she has eyes just like her father's, they are blue when skies are grey"ⁱⁱ has an appeal which I can only attribute to my emotional response to the song. So, our aesthetic judgments are often influenced by our emotional reaction to the work, which reason fails to address.

Like reason, emotion can be a powerful way of knowing, when used appropriately. It sees use in different ways in the fields of Ethics and the Natural Sciences. A rationalist approach undermines the role of emotion in making ethical judgments, as Tristram Englehart Jr. says that we should be “Impartial reasoners whose only interests are in the consistency and force of rational judgment.” But in practice, we often find emotion to be the inevitable explanation, or indeed justification, for our ethical decisions. The final premise on which our argument stands is generally fuelled by emotion. In other cases, you just have a gut feeling that something is right or wrong, and it’s difficult to describe why, even using biased, emotionally influenced words. And this emotional, intuitive backing is often aligned to that of the majority – which is perhaps the closest thing we can have to the truth in ethics. While emotion may be the driving force and passion behind our ethical decisions, we come to sophisticated ethical judgments using reason based on our emotionally charged axioms. Reason is used to translate between my abstract ethical beliefs and real life scenarios. Cutting the line at the school cafeteria is not something I have an inherent ethical belief about, but cutting in line means that the people in the queue have to wait longer which is not fair to them, and I think this injustice isn’t right – therefore, cutting the queue isn’t right. Thus, reason plays a part in processing our ethical decisions. The relationship between Ethics and Emotion is similar to that of Reason and Mathematics – the ways of knowing are crucial parts of the areas of knowledge, but not the only ones involved.

Finally, truths in the Natural Sciences are reached through the scientific method – truths are reached by falsification of alternatives. Data collection, theory

generation, creation of a hypothesis and testing of said hypothesis form the stages of the scientific method. While emotion may be present and guide a researcher's decisions in the second and third stages, it will not change the ultimate result of the experiment. In fact, The strength of the scientific method lies in this separation from emotion. Based on observation and experimentation – the knowledge gained is reliable and can be reproduced, unaffected by the emotions of the operator (although interpretations may differ). My ardent belief in my hypothesis about bacterial proliferation will not affect the growth patterns of e coli. Emotion may play a part in the stimulation of research, but it does not affect the outcome of said research. That is to say, emotion encourages the discovery of truths in the natural sciences, and certainly one's reaction to the discovery, but does not affect the nature of these truths. Emotion plays a minor role in the natural sciences, and is overshadowed by other ways of knowing. With the Natural Sciences' emphasis on empirical evidence, sense perception and consequent reasoning to draw conclusions from the evidence are essential. Multiple ways of knowing work in conjunction to give us the complete picture of the Natural Sciences, and this conclusion can be extended to the other Areas of Knowledge.

Each way of knowing can be used to make some progress in any area of knowledge, but even with conventional pairings of "Mathematics and Reason" and "Ethics and Emotion" there is no panacean way of knowing which fully addresses the area of knowledge, and there certainly isn't a way that extends over several areas as an all-encompassing approach. Certain ways of knowing may have greater utility than others and find some uses in various areas - Reason is apparently a multi-

purpose tool of sorts, finding use in several areas. Perhaps more of a needle nose plier, Emotion may have a smaller range of specialized applications, but it does its job well in appropriate scenarios.

There is a reason why carpenters have a toolbox with dozens of specialized tools – there isn't an all-in-one solution which can be used in every situation. The best we can do is to understand how and when to use the tools we have at our disposal.

Bibliography

i "Definition of Logarithm." *Oxford Dictionaries*. N.p., n.d. Web. 08 Dec. 2013.

ii **Ruess, Nathaniel Joseph/ Dost, Andrew/ Antonoff, Jack Michael/ Means, Samuel Thomas** "The Gambler". *Aim and Ignite*. **CD**. Netzwerk. 2009.