**Is replicability necessary in the production of knowledge? Discuss with reference to two areas of knowledge.**

The production of knowledge is an essential part of our modern world. As our understanding of ourselves and the universe develops, we must produce new knowledge to quantify and support it. It is monumentally important to consider the methods by which a piece of knowledge was produced alongside the knowledge itself, as these methods affect the quality, or reliability of the knowledge. In other words, an understanding of how knowledge is produced gives us confidence that the knowledge is in fact knowledge. In terms of justified true belief, the production of knowledge is the development of each of these components for a prospective piece of knowledge. In this lens, when looking to produce a piece of knowledge, we seek to justify a claim, verify that it is true, and develop belief in it. The concept of replicability in terms of the production of knowledge can be understood as recreating the context in which a piece of knowledge was produced, and determining whether the same knowledge is still produced. In a sense, replicability verifies knowledge. Again in terms of justified true belief, replicability works to reinforce these three components of knowledge. However, the role that replicability plays in producing knowledge is subject to the knowledge being produced and the area in which that knowledge resides. This essay will explore replicability in both the arts, and the natural sciences.

In terms of the natural sciences, replicability is a core component of the production of knowledge. The scientific method relies on writing detailed procedures to allow other scientists to replicate the experiment and verify its results. And in fact, in the natural sciences, knowledge is only widely accepted once the experimental findings have gone through a peer review process where other members of the scientific community have replicated the experiment, and either verified or rejected its results. In addition to that, it is good practice to build replicability into an experiment before the peer review process even begins. When designing an experiment, the scientific method requires that multiple trials be conducted across the variable being tested, to ensure that small mistakes or outliers do not skew the results. All of this is to say that, in the natural sciences, the concept of replicability is foundational to the production of knowledge. I have experienced this first hand, when conducting an experiment for my internal assessment in physics. I was attempting to measure the magnetic field that was induced when a voltage was applied to a coil of wire with varying turn numbers. The variable I was testing was of course the number of turns in the coil, but when designing and running the experiment, I made sure to take multiple measurements for each turn number. This allowed me to be confident in my measurements because I could take the average of the measurements and eliminate small sources of error or bias in the measurements. The knowledge I was producing in this experiment was the relationship between turn number and magnetic field induced, and the replicability that I had built into the experiment allowed me to be confident that this knowledge was true.

However, this understanding of the natural sciences is quite limited in that it is incredibly theoretical and idealistic. In the real world, scientists are subject to pressures and biases that affect the production of knowledge in this area. In recent years, a so-called replicability crisis in the sciences has been getting more and more media attention. In essence, this crisis focuses on the fact that a concerning number of influential experiments and results have in fact not been replicated by other scientists and verified. The cause of this can be traced to the fact that there is simply no real incentive for scientists to verify existing experiments. Scientists are under pressure to conduct new experiments that have exciting results rather than verify existing ones. It’s a boring job, so no one does it. While this crisis has been getting attention recently in human sciences like psychology, the same pressures and incentives exist for scientists in the natural sciences. In 2016, a biotechnology company called Amgen released their findings when attempting to confirm experimental findings published in a variety of prestigious scientific journals. This came after a different project in 2012 by the same company, where researchers failed to reproduce findings from 47 of 53 incredibly influential papers relating to cancer research. (Baker, 141) However, according to a survey of 1500 researchers conducted in 2016 by Nature, while 52% agreed that a replicability crisis exists, most of them also reported that they continue to trust published literature. (Baker, 452) This speaks to the counter argument that replicability is not necessary in the production of knowledge in the natural sciences. If we are still willing to accept and trust knowledge produced by experiments that have not been verified, then replicability is indeed not necessary when producing knowledge in the natural sciences.

In the arts, the process for producing knowledge is not so concretely defined, however. Hence, it is important to consider not only the art being viewed, but the context in which it is viewed. The physical surroundings of a viewer as well as their mental state can affect the knowledge that they produce when viewing a piece of art. This poses the question, to what extent is the context, rather than the art, producing knowledge when viewing an artwork? This can be best answered through an example. In my HL English class, we studied a book titled “Citizen” by Claudia Rankine. This book addresses racism in America and the effects of microaggressions on the lives of African Americans who live here. Importantly, the very last page of the book contains an image of a piece of art by Joseph Mallord William Turner. When I viewed this piece of art my mind was laser focused on these social issues. As a result of this, the knowledge I produced from viewing this art was centered around how the art portrayed the struggle of African Americans. The context that this piece of art was presented in caused me to produce specific knowledge that was dependent on the context. Had I viewed this artwork in a different context, the knowledge I produced from it would not have this same focus. From this, it can be argued that the context under which a piece of art is viewed has a measurable effect on the knowledge that is produced when viewing that art. Hence, this replicability question can be answered. The context surrounding a person while they view art is incredibly complex, and because of this, it is almost impossible to replicate. Because of this, it can be argued that replicability is not necessary in the production of knowledge in the arts.

However, this viewpoint is limited in that it assumes that knowledge in the arts is personal. Another perspective arises when considering knowledge in the arts as being shared knowledge. For this production of shared knowledge, some aspect of consistency and agreement is necessary. This is in direct contrast to the previous argument, where the uniqueness of the situation in which art is viewed is vital to the knowledge that is produced. From this perspective, the context in which a piece of art is viewed is less important to the knowledge that it produces than the art itself, as the message that the art attempts to convey is what is consistent across viewings, and what the knowledge that is produced will focus on. An example of this can be found in art museums, which attempt to do this by carefully cultivating the environment in which art is viewed. They present artworks against simple backgrounds, in quiet spaces, where viewers can view the art distraction free. Not only does this simplify the physical context of the art, but to some extent it puts the viewer in a mindset that caters to focusing on the art for what it is. These actions improve the replicability of the viewing experience. This means that more people will have a similar experience when viewing the art, and from that produce similar knowledge surrounding it. The similarity between the knowledge produced by individuals leads to the production of shared knowledge surrounding the art. From this perspective, the replicability of the viewing experience is important for the production of knowledge. It can be argued, then, that replicability may be necessary in the production of knowledge in the arts.

In conclusion, replicability plays an important role in producing knowledge across different areas of knowledge. In some areas, like the natural sciences, it is theoretically foundational. It is the view of many that knowledge cannot exist in the natural sciences without replicability. This changes, though, when science is subjected to pressures from the rest of the world, and replicability gets pushed to the side for prestige. In others like the arts, replicability becomes more or less important depending on the type of knowledge that is being produced. If knowledge is personal, then the uniqueness of the mental and physical surroundings a person is in when viewing art, and their inherent irreplicability, still produce knowledge. If knowledge is shared, a consistent, and hence replicable experience is necessary for the production of knowledge. Regardless of the area in which knowledge is being produced, it is important to examine the effect that replicability has on the knowledge, and understand how it contributes to the knowledge as a whole.

**Word Count: 1568**

Works Cited

Baker, Monya. “1,500 Scientists Lift the Lid on Reproducibility.” *Nature*, vol. 533, no. 7604, 2016, pp. 452-454. *Nature*, https://doi.org/10.1038/533452a. Accessed 3 12 2022.

Baker, Moya. “Biotech giant publishes failures to confirm high-profile science.” *Nature*, vol. 530, no. 7589, 2016, p. 141. *Nature*, https://doi.org/10.1038/nature.2016.19269. Accessed 2 12 2022.