**Tutorial 1**

* **Exploring ideas in popular science**

1. “The account of the origin of life that I shall give is… probably not too far from the truth.” Is it?

Consider the assumptions made about the initial conditions on Earth, the conduct of lab simulations, the idea that the impossible becomes possible over a long period of time...

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| **Student Name** | **Group Response** |
| Group 1  Richelle  Shi Qian  Amos  Saidah  Xinyuan | No. His accounts are simply another theory of the origin of life that he himself thinks is pretty accurate, but no one will ever know for sure because there was no one to observe it at that time.  Although he cites scientific experiments/evidence, there could be different possible combinations of starting material that could have given rise to the origin of life. |
| **Group 2**  Benedict  Min Jet  Bo Cong  Ryan  Fang Yu | Yes. Since no one was present at the origin of life, anyone who tries to give an account of the origin is likely to be equally distant from the truth. Only through scientific testing can one reduce the distance from the truth.  However, based on the scientific evidence, it seems that the theory that is agreed upon and able to explain the many observations is most likely close to the absolute truth.  We also think that there is certainly room for the acceptance of other theories, and this may not be the only theory for the origin of life. |
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1. Is there a paradox in the idea of an evolutionary trend towards higher accuracy of replication in molecules?

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| **Student Name** | **Group Response** |
| **Group 2**  Benedict  Min Jet  Bo Cong  Ryan  Fang Yu | Yes, only in the beginning, as higher accuracy means fewer errors, however, it was stated that the accumulation of errors was needed for the formation of more complex life forms for evolution to proceed.  At later stages, organisms want stability, so they need higher accuracy.  We also know that the environment is always changing either due to climate change or introduction of new predators, hence a once well-adapted organism that fitted in one environment may not be as well adapted to the new environment. Hence, room for error (the inaccuracies) is needed to generate variation for a better adapted organism to thrive in the new environment, and the inaccurate becomes the new accurate since it provides benefits for the organism to survive. |
| Group 3  Yu Xian Jia Wei Deon Tei Kar  Lara | Yes. At first it is contradictory because making mistakes in the gene replication is needed for evolution since evolution is based on the concept of ‘survival of the fittest’. In other words, without mistakes in gene replication there would be no evolution.  But also no, due to the long period of time and the large rate of replication, borrowing the “infinite monkey theorem” example; there will eventually be more “fit” molecules that have a higher rate of replication than that of the less “fit” ones. Hence it is safe to assume that the replication of molecules becomes more accurate after a long period of time. |
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1. “They have come a long way, those replicators. Now they go by the name of genes, and we are their survival machines.” How has this chapter altered your understanding of the gene (or of the way you think about it)?

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| **Student Name** | **Group Response** |
| Group 3  :D | * Instead of an antagonistic relationship, we realize that the relationship can be considered mutualistic. * We thought that we were the ones using them to survive, yet it reverses the paradigm where we are being utilized instead. * The common understanding is that humans and genes are part of the same entity, but the chapter tells us that the 2 are separate |
| Group 4  Kailin  Adinda  Meng han  Francis | * Conventionally, we would think of genes being used by us. We use them for our survival. However, this sentence flips the narrative because it describes the genes as using us as vessels for their survival. * Dawkins first describes genes as replicators, then calls them genes (scientific term) to make it more approachable * Genes may seem very complex as of now, but it all started from very simple beginnings |
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|  | Functional recontextualisation |
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1. “uman suffering has been caused because too many of us cannot grasp that words are only tools for our use.” Why is the author saying this? What point is he making?

Consider the larger context on p. 18.

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| **Student Name** | **Group Response** |
| Group 1 | The author is saying this to display his exasperation at all the reader’s focus on matters that is not the main point that he was trying to convey. Specifically on the word “living”. We are, after all, the ones who created these words and dictated their definitions, hence we shouldn’t let these definitions dictate how we use them. He wishes to take away the reader’s fixation on definitions but instead, directing them towards viewing the bigger picture.  He emphasizes that the importance of the origin of life is not HOW we define them (whether as living or non-living) but how we describe them. From there, words should be used just as a platform to facilitate and advance discussion and not as a literal tool which will draw unnecessary boundaries. |
| Group 4  Kailin  Adinda  Meng han  Francis | * People were too nitpicky when it came to the words “living”; The purpose of the author was that he just wanted to convey the idea of the replicators, no matter what the words used. The author was frustrated that people were being petulant. |
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* **Exploring science communication**

1. How would you describe Dawkins’s writing style as seen in this chapter? Discuss the impact of his stylistic choice on readers. To do this, consider the following:

* Is his writing best described as narrative, descriptive or argumentative?
* What effects on the reader are achieved by his choice?
* What is gained, and lost, as a result of his choice?

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| **Student Name** | **Group Response** |
| Group 1 | * Argumentative (Examples, analogies, metaphors for better understanding)  1. From page 18, he suddenly adopts an argumentative stance (changed to informal writing after easing the reader into the topic) (“the next important link...”) 2. Actually an argumentative writing? Trying to convince the reader of his point  * Easy to read and follow along, draws the reader’s attention and interest, kicks start the reader’s interest in the topic (which they may continue to further read or research about) * He relates concepts to everyday objects (e.g., rain drops, soap bubbles in the second paragraph) + everyday experiences (e.g., getting jackpots on football pools) + metaphors (e.g., hemoglobin as a thornbush) * Lost the seriousness/significance of the topic? * Gained: interest and understanding |
| **Group 2**  Benedict  Min Jet  Bo Cong  Ryan  Fang Yu | 1. Overarchingly argumentative with narratively descriptive content – describes concepts narratively --> Trying to support darwin’s argument about evolution   (Argumentative: aim to convince readers; narrative: telling a story/involves characters; descriptive: to immerse the reader’s 5 senses)   1. As a reader I found it enjoyable and it piqued my interest  * the chapter can be digested easily by the reader (absence of complicated scientific terms which cause readers to lose focus and interest in the chapter) - the word “genes” only brought up in the last sentence * explain complicated topics by using simple ideas and everyday things such as primordial soup as brown water or the use of thornbush used to explain haemoglobin * offered a different perspective on how we view genes -> appeal to emotion * page 18 --> He anticipated challenges from readers such as the lack of common understanding/confusion/backlash/angst from readers so he was justifying the use of specific terms such as “living” so that the readers and him can be on the same page   3.  Gain: Able to capture the attention of a wider audience that might not be able to understand or appreciate a technical read.  $$$revenue$$$ #nytimesbestseller :)💸💰🤑  Loss: Accuracy of certain concepts e.g the formation of a cell. In the chapter, he briefly explained the formation of the cell as just a protective layer for continued survival but misses out on the many interactions that made such a formation possible. |
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1. Examine carefully the opening paragraph. How does Dawkins arrest the interest of the reader? Make suitable references to the paragraph and discuss the effects of the author’s choices on readers.

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| **Student Name** | **Group Response** |
| Group 3 | 1. He used contradictory sentences which perplexes the reader and makes them want to read on, to solve this sense of confusion . “In the beginning was simplicity. It is difficult enough...” 2. A very big claim which arouses the reader’s curiosity (In the beginning was simplicity.) 3. Keeps the reader hanging by ending the paragraph with the sentence “I will try to explain the great theory” without explaining it actually. 4. He says that Darwins theory is “difficult to explain” and therefore, he will try to explain it in a more “general way than is customary”. This assures the reader that the author is not going to explain the theory using technical jargon which can be difficult to understand. |
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|  | Deontological appeal |
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1. How is the reader’s interest sustained in the body of the chapter? Make suitable references to specific parts of the chapter and discuss the effects of the author’s choices on readers.

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| **Student Name** | **Group Response** |
| Group 4 | “Miscopying of many translations...” (Analogy of replication) page 16 |
|  | Introduced big names throughout the text (Name dropping, hooks) |
|  | Introduced popular quotes “Survival of the fittest” |
|  | Personal pronouns: I , we, you |
|  | Conversational tone (using words like “actually”, “of course” etc. And use of rhetorical questions (pg 19)) |
| -> don’t quote me on this | Uses scientific lingo a few times such as “purines”, “pyrimidines” ; make the reader feel “smart” so he will continue reading |
|  | Use of humour |

* **Group reflection**

In your groups, you will work on a 100 to 150-word reflection using the template provided. Your group reflection should focus on:

1. whether your group found Dawkins’ use of the deontological appeal effective and why; and
2. one interesting fact your group learnt about genes which you had not known before.

Type your group reflection in the space below. Your tutor will offer feedback.

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|  | **Group Reflection** | **Tutor’s feedback** |
| Group 1  Richelle  Shi Qian  Amos  Saidah  Xinyuan | 1. On one hand, yes, it is effective. Creating a sense of curiosity attracts the reader's attention and they may potentially go on to learn more about the topic at hand. However, the readers are more “awestruck” at the complexity of the issue and not necessarily so intrigued that they would act upon that initial awe. We read the chapter in a “touch and go” way, not placing much importance on the topic since he wrote in such a “storytelling” way. Moreover, there is no urgency in this topic unlike more pressing issues since it is not an imminent “threat”/something alarming. 2. We came to realize the mutually beneficial, bidirectional relationship between us and genes, instead of simply viewing genes as tools for our use. | You could be more specific: which parts created a sense of curiosity? As you mention there is no urgency, how could the appeal be strengthened here? Or must everything have an immediate practical result to be considered worthwhile? |
| **Group 2**  Benedict  Min Jet  Bo Cong  Ryan  Fang Yu | **YES:** The concept of our origins generally is a thought-provoking concept as it has always been a big unsolved mystery. Our origins could sometimes to be linked to huge questions like the reason for our existence  &  **NO:** A reason why we did not feel it appealing was because when I read those deontological statements, I read it dismissively. I did not stop to ponder and think to even agree or disagree with these statements.  His argument that we as humans should be interested in these topics was not convincing enough. I argue that climate change is a much important issue that we all should focus our resources on and do more for. As he stated, these things no matter what use of words have already happen, however the future is uncertain.  **Interesting fact:** The concept of the survival of the stable is an interesting theory and has made us perceive the objects and state of things around us in a different perspective. Like how humans and AI are quite similar, we are all operating on a string of chemicals or codes. Even things that are invisible to the naked eye such as our “genes” follow this rule. This just shows how extensive this theory can go and explain! | True! People love a good mystery and that could be a stepping stone to further exploration.  How could his arguments be more effective? Agreed that climate change is a pressing issue that needs attention. However, is there space for other kinds of research or should resources be allocated based solely on the potential for immediate practical applications? |
| Group 3  😊  Yu Xian Jia Wei Deon Tei Kar  Lara | Yes. In the opening paragraph, the author used a big claim which arouses curiosity/awe in the reader since he quickly claimed that “the beginning was simplicity”. However, he immediately added that it was ‘difficult enough explaining how even a simple universe began’ which compels the reader to read further.  No. The motivation to read the chapter shouldn’t be a due to duty but curiousity of the subject at hand. The matter of how life was formed is far too foreign and distant (in terms of time) for us to grasp its true importance. The matter isn’t too urgent a matter that demands my immediate attention.  We learnt that genes are actually “controlling” us, and we should think of them as living things similar to us. | Why do you feel strongly that it shouldn’t be due to duty? Deontological appeals are based on the assumption that there is an intrinsic value in the act/action itself, rather than focusing on the consequences. In science writing, it might seem easier or more effective to appeal to the readers’ sense of awe/wonder/curiosity... rather than a sense of duty. |
| Group 4  Kailin  Adinda  Meng han  Francis | Yes, the author was able to generate curiosity within the reader through his writing, although the readers might feel unsatisfied at the end as the answer to the complex mystery that is life seems a little too simple; How do we know that the final version of the theory is this?Furthermore, some may get overwhelmed by the philosophical ideas and thus turned off. At the end of the day, we still felt the goosebumps, making us want to read deeper.  Genes should not be underestimated and we should not think of them as passive and inert. Rather we should think of them as the driving force for their own survival and our existence. | You could be more specific: which parts of the writing were effective in generating curiosity? |