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The Violation Imperative Part II: A Philosophical Critique of the Public Health Service's Definition of Falsification as Research Misconduct

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Abstract: The purpose of this paper is to critique the definition of falsification as research misconduct according to the Public Health Service (PHS) in order to better understand what it entails. In support of this purpose, the approach decided upon for analysis was philosophical including framing the issue borrowing from both mereological and epistemological perspectives. Through the consideration given to parthood relations of mereology, we gained insight from a cognitive imperfection standpoint about similarities that exist between the epistemic constraints on knowledge and the nature of violations concerning research misconduct. Findings from the examination of a case study include the significance of accuracy in representation in falsification as misconduct and the core dimensions comprising an instance of falsification, which are *Deliberateness, Alteration, and Inclusion*. Given that either behavior or actions *must* occur that violate these three aspects in order to qualify as an instance of misconduct under falsification, the author proposes that, at a minimum, any revisions made to the definition of falsification stipulate what he refers to as *the Violation Imperative*.

Keywords: *The Violation Imperative, Responsible Conduct of Research (RCR), Research Misconduct, Science, Definition of Falsification, Philosophy, Ethics*

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Analysis of Falsification and Research Misconduct Through Case Study

In consideration of the severe nature of the consequences that may potentially result from involvement in suspected cases of falsification as misconduct, elaboration and //refinement of the definition of falsification as fraud under the rubric of research misconduct is warranted and would likely reduce the number of new allegations and convictions. After considering allegations and fraud in Part 1 of this series, one way to progress from this point is to challenge our preconceptions related to research misconduct through the careful study of a hypothetical case from Macrina (2014). We will begin to examine the essence of the problems surrounding the way falsification as misconduct is currently defined according to the Public Health Service (PHS). Through examination, we should be able to derive some sense of core aspects common among instances of falsification as misconduct what an adequate definition ought to entail. The case that has been selected involves two fictional characters, Joshua and Ellen, and their particular ethically and suggestive behavior.

Case Study Background

Joshua has obtained unexpected results from his research and underexposed the image to conceal them. The purpose of concealing the results was so that others (i.e., competitor advantage) would not have an opportunity to use what he believes to be clues. Joshua must first thoroughly investigate to where they lead before anyone else because he believes the outcome will be groundbreaking. Joshua also does include a statement with the doctored image admitting that he removed the unexpected results, but Ellen believes that Joshua was misguided. She then recommends that he eliminate the areas showing the unexpected results entirely by cropping the image instead.

The most important fact of this case, in the author's opinion, would be the admission by Joshua that the image that he used had been intentionally modified from its original state, which he does not dispute. In addition, if adopting the PHS definition of research misconduct and applying it to this case, in order to make a convincing argument that Joshua is guilty of research misconduct, the onus will be on us to prove that Joshua's action was either one of fabrication, falsification, or plagiarism *in* proposing, performing, or reviewing research or reporting results. We will have to compare Joshua's actions to those that Ellen suggested in order to determine whether significant characteristic differences between them exist that would substantiate the labeling of either, both, or none as a legitimate case of research misconduct.

To accomplish that goal, one must build a case starting with detailing the definition of research misconduct that is considered and explaining the way in which the PHS definition is being interpreted. Next, a framework for interpretation will be presented that provides the context and perspective that was used for interpretation, which will then be followed by an explanation of the reasoning that reveals the link to substantiate both the framework the author used as well as the manner in which the definition was interpreted. Lastly, as the discussion tapers toward the end, violation types are considered in relation to their accuracy comparing outcomes with what occurred. Additionally, a prescriptive argument for what aspects ought to be required to conclude falsification and misconduct have occurred will be presented.

The case will challenge preconceptions regarding actions or behaviors considered research misconduct and require the scrutiny of even the minutest of details. Although at least superficially initially, it may seem to be evident who would be wrong and why they would be if this were a real, one must exercise caution in relying on intuition or gut feeling. From each person's perspective, possible courses of action and their respective outcomes will be carefully considered. Ultimately, because of the suspicion we expressed concerning the circularity in the

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existing PHS definition, instead of relying solely on the definition of falsification as the unit of analysis to guide us in determining what ought to qualify as misconduct, the evaluation will focus on the suspected violation itself as an instance and attempt to understand why (i.e., applied, not theoretical).

Concentrating on the violation in question will provide additional information that may not otherwise be derived as to *what* aspects it is that makes the suspected falsification misconduct and *why* that might be the case.[1] Once those aspects have been identified, we may then reconfigure them into a possible definition. In so doing, a reconfigured definition developed should provide a clear and more comprehensive notion of what ought to qualify as falsification under the rubric of research misconduct.

The PHS Definition of Research Misconduct

There have been several iterations of definition for research misconduct within the area of responsible conduct of research (RCR). Certain aspects of the notion of misconduct are integral to defining it and are included in the chosen definition which will be referred to in the present case. The definition of research misconduct referred to is that of the Public Health Service (PHS). Accordingly, research misconduct will be understood for the present purposes as "*fabrication, falsification, or plagiarism (FFP) in proposing, performing, or reviewing research, or in reporting research results (PPRR),*" which is the definition found in the Public Health Service (2005) addition to the Code of Federal Regulations (CFR).

Each of the three aspects of the definition may be reduced to the following explanations: (a) *Fabrication* consists of making up data or results (i.e., the commission) and recording or

[1] This analogous use of "what" and "why," or qualification and reasoning, for falsification and violations of misconduct refers to a later discussion that will be had in the third and last paper. In that paper, Part III, we consider the Sociology of Scientific Knowledge (SSK) and its association with the content of scientific knowledge. Definitions and actions relating to falsification are subject to debate, and it is through the SSK that one asks "what makes the content science?" and "why that is the case?" in earnest.

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reporting them (either provide results [committed] for which there is no data [omitted], or provide data [committed] for which there is no record [omitted]); (b) *Falsification* may be understood as manipulating research materials, equipment, or processes, or changing or omitting (i.e., the *commission*) data or results such that the research is not accurately represented in the research record (i.e., the omission); and (c) *Plagiarism* is the appropriation of another person's ideas, processes, results, or words (i.e., the *commission*) without giving appropriate credit (i.e., the omission) (Public Health Service, 2005). Crucial to acknowledge is that honest mistakes *do not* count as instances of research misconduct (Public Health Service, 2005), which was a significant concern for some regarding earlier attempts to define that has been resolved by the addition of this clause. As we begin, the definition of research misconduct will be critiqued from a philosophical framework including mereology and that of epistemology. Keywords, ideas, and relationships will each be identified, and an argument shall be presented that justifies the author's decision to interpret the definition mereologically.

Mereological Interpretation of the Definition of Research Misconduct

The keyword with respect to the provided definition is the locative and prepositional "in." Being locative and prepositional, this usage of this word would lend credibility to the decision to interpret the definition as a mereological concern. Mereology deals with parthood relations, or the relationship of a part to the whole (Stanford Encyclopedia of Philosophy, 2016). The framework from which the author approached this problem was philosophical. From such a philosophical perspective, mereology seemed appropriate for framing the problem itself, as the author found the definition of research misconduct as the whole to be comprised of two distinct parts in FFP and PPRR.

The Role of Prepositions in Establishing the Parthood Relationship

In the case of the definition of research misconduct provided, although there may be other equally useful ways in which to interpret the prepositional "in," we have chosen two in which the word "in" makes the definition as unit coherent and appropriate as used in the definition. The main distinction between both interpretations lies in the dichotomous nature of the particular interpretation of the preposition "in." That is, the author views "in" as describing the parthood relation "materially" where the relation must exist between two material parts only. Conversely, "in" may describe an "immaterial" relation consisting of at least one immaterial part, but there may be two. When describing the parthood relation materially, both parts are miscible, and the relationship yields a composite, tangible whole. If the parthood relation is being described immaterially, at least one component must be immaterial in that it is incapable of incorporating or otherwise combining into anything.

Materially Prepositional "In." In the first, if "in" is to be understood in the literal material sense in which one thing is a part of another, then the FFP, or its proximate result, must have occurred as a part of Joshua's PPRR to complete the definition whole and make this research misconduct. That is, one's action or behavior must have directly led to *deceit by leading others to believe the opposite of what they would have otherwise* had one not engaged such action or behavior.

For instance, if, while reclining in a soft cushioned chair at waiting for Ellen to go over her critique, Joshua sees her from inside the store approaching the door before she sees him. Immediately he shuts his eyes and begins to make snoring sounds analogous to committing two of three actions suggesting misconduct (i.e., he is making things up and not accurately representing himself [a.k.a., Fabricating and Falsifying]), then when she arrives at his side, she will believe that he is sleeping. Joshua's intentional eye-shutting and fake snoring *directly led* Ellen *being deceived into believing* he was asleep; however, believing he was asleep *is the*

opposite of what Ellen would have believed otherwise (i.e., that Joshua is awake) *had Joshua not engaged* in eye-shutting and fake snoring *behavior*. Based on these facts, we would argue that because Joshua committed FFP in PPRR, he has satisfied both parts of the criteria with the true parthood relationship comprising the definition of research misconduct as a whole in this situation.

Immaterially Prepositional "In." On the other hand, "in" may be interpreted to represent an immaterial parthood relation such that FFP, or its proximate result, is a figurative part of the definition whole along with PPRR, but the relationship between FFP and PPRR may be temporal. With a relation being temporal, the act or behavior of FFP need only occur *during* (i.e., temporal aspect) the course of PPRR occurring *without* being a literal part of it (i.e., immaterially a part). However, it would not qualify as meeting the criteria for the definition of research misconduct in this circumstance.

For example, were Joshua to have disguised himself *while presen*ting a report, but no aspect of the report itself was in any way fabricated, falsified, or plagiarized (FFP), although Joshua may have been guilty of not accurately representing himself (i.e., falsification) the same cannot be said of the research. Since a disguise of one's face or hair is not capable of being incorporated into the research report, it would not matter. Joshua may have been dishonest about his appearance, but in this instance according to the current interpretation of the definition and understanding of prepositional "in," he has not committed research misconduct. Therefore, how one interprets the parthood relation of the preposition within the definition whole is what appears to be the determining factor of whether research misconduct has been committed.

As to whether "in" is to be taken as a locative-literal material or figuratively immaterial sense, it is the literal material sense of the word appears to allow for better coherence among the parts. Although one can fabricate, falsify, or plagiarize in any number of ways, if it does not

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literally materially occur and relate mereologically the FFP part to the proposing, performing, reviewing, or reporting PPRR part comprising the research whole itself, then there is insufficient relevance or evidence to merit a determination of research misconduct being committed according to the definition whole.

The reader should keep in mind what the degree of relevance of the FFP and PPRR parts to the definition whole may be. Furthermore, it is also essential to determine whether what Ellen suggests is any different from Joshua's actions qualitatively. Nevertheless, to address this concern by determining whether qualitative differences exist, one must scrutinize precisely *what* was done and *how* it was done. In doing so in the following section of this paper, both the ontological (i.e., what) and epistemological (i.e., how) commitments will be made explicit concerning grievous violations to which I refer as errors of *commission* and *omission,* as it pertains to research misconduct according to the PHS guidelines (2005).

Errors of Commission and Omission: Violations Link to Cognitive Imperfection

Despite the existence of notions for violations as both errors of *commission* and *omission* concerning research misconduct, it is not evident, at least to the author, that the two ideas are distinct. Regardless of whether they are distinct, a consideration of the suspected violation for which Joshua is responsible ought to allow us to determine the types involved.

The *falsification*, or inaccurate representation, concerning our case has occurred because Joshua both *performed* the act of deleting entries (i.e., *committed)* and *failed to include*, or *omitted*, the entries in the research record. Upon closer inspection of the alleged act of falsification that occurred, the *commission* may be interpreted as the "*how*" of the violation whereas the *omission* may be construed as the "*what*." The characteristics mentioned concerning the questionable behavior suggested that, as a framework for comprehension to be used in this section, *cognitive imperfection* may facilitate clarifying it conceptually.

Existing in a state of cognitive imperfection as we do, epistemologically speaking, the ability to claim factual knowledge, whether it be considered subjective or objective, is impaired. As a result of the impairment given the realm of actual things to be known, humankind will always have deficiencies in knowledge due to the manner in which we come to know through *sensory perception*. Regardless of how pristine the condition of the particular faculties responsible for providing one with information on which to rely for *justification of knowledge* claims, perspective necessarily filters or skews what is known to a degree.

Whatever the degree is to which perspective on a knowledge claim is filtered, it is guaranteed that due to an inability to perceive without perspective some of what one comes to know will be imperfect. Thus, any cognitive activity that is based on such incomplete knowledge guarantees that errors will inevitably occur. When these errors do occur, they will be either of two types: errors of *omission* or errors of *commission* (Rescher, 2003).

Error, from Latin errare" means “to stray, err” according to Oxford Dictionaries (2019). When straying, one is moving *away* from the *right* or *correct* path. In the case of responsible conduct of research, that *right, correct or honorable* path away from which one can stray is ethical behavior as outlined in the regulations given by governing organizations such as the PHS. Failure to adhere to guidelines that have proscribed individuals in particular professions from engaging in certain behaviors or conduct results in *violations*. As is true of erring of any kind, violations may be understood to result from *omission* or *commission* when related to suspected cases of research misconduct.

Joshua’s suspected violation, *per se,* is considered the unit of analysis with which we are concerned. As the unit of analysis to evaluate or assess research misconduct under the guise of *falsification*, it should be recognized that the suspected violation consisted of both acts of *commission* as well as *omission*. Since both types of the act were involved in the same violation,

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it becomes necessary to inquire whether in all legitimate instances of error or violations of both types must be concurrent comprising the same case of misconduct.

Acts of commission and omission are analogous to the *process* that resulted in the violation and the outcome of the *process* as the *product* that led to the violation, respectively. Given the nature of the relationship between a process and a product, even in the case of a *process* that has as a *product* the *process* itself, could it be possible for a violation of commision/process/"the how" to exist without a corresponding violation of omission/product/"the what" and *vice versa*?

While it would seem possible to violate through either *commission* or *omission* solely, we shall determine whether this is the case. An *omission* focuses on the aspect of "what" that led to the violation. Nonetheless, there can be no what without a preceding how. Acts of commission, conversely, concentrate on the aspect of "how" that lead to violations. Although perhaps not simultaneously occurring, both types of act necessarily occur together and in sequence. It is through the commission of some act an omission of some sort is implicit and by omission of something a commission of some sort is implicit, as well. Thus, it seems as though each entails the status of existence of the other by its own.

Dimensions of *Deliberateness, Alteration*, and *Inclusion Characterize a Misconduct Violation*

In comparing both Joshua's actions with those suggested by Ellen, was there a significant difference between modifying what is included in an image and cropping it so as not to include a portion? Both alternatives it could be argued are considered deliberate and alterations. As a result of such deliberate alteration, pertinent visual data were excluded from the research reported that was obtained *during* the experimental process. Therefore, the author argues that

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there is no qualitative difference between Joshua's actions and Ellen's suggestion. Ellen's suggestion is as unethical as Joshua's despite being accomplished by different means.

Responsible Conduct of Research (RCR) consists of four main areas related to subjects, the research itself, the environment, and fiscal responsibility (Macrina, 2014). According to Macrina (2014), deviations from the standard through both violations of *omission* and *commission* may occur with equally grave consequences for the researcher (p. 18). *Violations of omission* and *commission* fall under the rubric of falsification in research misconduct, as defined previously to relate to the manipulation of research rendering an inaccurate representation of the record of research (Macrina, 2014). When not a result of an honest mistake, a *violation of omission* refers to leaving out information or data obtained whereas a *violation of commission* occurs when an act or behavior is performed, executed, or otherwise done that results in the transgression (OUP, 2019).

Joshua's infraction consisted of an act to *deliberately alter* an image of the research record to display the expected results *only* but not the unexpected ones. It was this decision to deliberately alter an image made by him that rendered his work an inaccurate representation even though the explanation had been provided in the legend. Because both results occurred in the same experiment and may ultimately be equally important, selecting which results to report visually or verbally in one's research while leaving out or concealing others neither accurately represents the findings in the record of investigation, nor does it allow for the importance of unanticipated findings to be determined by the research consumer. This is just one perspective from which this case may be interpreted as tantamount to *falsification*. Furthermore, the *falsification* was comprised of both an *act of commission* and an *act of omission* in Joshua's case that together demonstrated the essence of falsification as fraud under research misconduct.

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Ellen's suggestion of cropping the image to eliminate the unexpected findings while leaving only the expected ones, she claims, is better presumably because doing so would avoid having to *deliberately alter the picture* and the subsequent need to explain. Although the difference is that Ellen's suggestion avoids the need to explain, unfortunately, the similarity is that cropping the image of the linear array of amplified DNA fragments in the gel would be both *deliberate* and an *alteration*, which is precisely what characterizes Joshua's situation.

Joshua violated through *commission* (i.e., deliberate alteration of something included) whereas Ellen could be argued to have suggested he should violate through *omission* (i.e., not including something). That notwithstanding, the author claims that this distinction between Joshua's and Ellen's actions is merely apparent and in no way render Ellen's suggestion any less unethical in that the intentional cropping of the image to exclude unexpected results would be *at least as deliberate* an *alteration* as the underexposure of the image by Joshua was.

Although Ellen's suggestion would be *at least as deliberate an alteration* as Joshua's actions, this does not imply equivalence. Might there exist another factor that would allow us to definitively determine whether any of the two actions would be considered the worst case of research misconduct and why? Yes. While Joshua may have *deliberately altered* the image, he *included* what he changed. Ellen, however, suggested that he *deliberately* modify the image (by cropping) but would then have him *fail to include* the altered portion. Therefore, it appears that *inclusion* is the one significant difference that distinguishes between both Joshua's and Ellen's *deliberate alterations.* Taken collectively, satisfying the set consisting of dimensions of *deliberateness, alteration, and inclusion are what ought to be* required for falsification as fraud under research misconduct to have genuinely occurred and comprise what the author refers to as *the Violation Imperative.*

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It may seem pedantic, but, in fact, this one detail concerning inclusion is an example of what I refer to as a *relevant dichotomy* (Carroll, 2019). A *relevant dichotomy* may be defined as *a significant aspect, quality, or factor the sole presence or absence of which can be used to consistently discern two or more seemingly identical things from one another*. By consistently, it is meant that the aspect used as a *relevant dichotomy* both *accurately* and *reliably* performs when used. In other words, not only must a relevant dichotomy achieve its goal accomplishing what it was intended to, but it must do so each *time*.

An exemplar of a *relevant dichotomy* would be the use of fingerprints to distinguish identical siblings from one another. In otherwise genetically and physically identical siblings, the fingerprints of each one are unique. Due to their uniqueness, fingerprints both accurately and reliably discern any two such siblings from one another whether identical twins or the case of quadruplets.

Along with both *deliberateness* and *alterations*, the aspect of *inclusion* is both necessary and sufficient to consistently distinguish between both Joshua's actions and Ellen's suggestion. Unlike Joshua who included an explanation for the evident *deliberate alteration* that verbally correlated with what was visually removed, Ellen's suggestion would result in a) it being nearly impossible to determine that the picture was manipulated at all, and b) not including an explanation of what was, and why it was, deliberately altered. Based on these facts, the author finds that Joshua's actions and behavior were not research misconduct. Furthermore, Ellen's suggestion would qualify as a case of failing to represent findings accurately in some form or other satisfying the criteria for falsification under the definition of research misconduct.

Accuracy in Representation

Representation is symbolic. In the case of the concept of eight, two multiplied by four, four multiplied by two, two times four, two x four, 4 x 2, 2 times 4, 2 x 4, 2 + 2 + 2 + 2, and 4 +

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4 all symbolically represent the same thing. Despite the various ordering, using either symbols to represent numerals and mathematical functions, or words to describe the numbers and steps to be taken, it may be concluded that each way demonstrated that eight was an equally accurate representation of the same concept of eight. Nonetheless, if the author were to use this symbol 八 in relation to the same idea, then it may not be perceived as accurately representing eight. The reason it may not be perceived accurately is not merely because the author altered the symbol, but because *the person perceiving the symbol might not recognize it*. However, if the individual knows that the symbol is in Chinese for the concept of eight, then they will find that it was an accurate representation. **Thus, *familiarity with what is to be represented and with that used to represent it are required in order to claim there was an accurate representation.***

It may be noted that sometimes the symbols were identical in different expressions, while others they were not. However, **despite the differences or similarities to one another observed in the variety of ways in which the concept of eight was presented, the accuracy in representation determined based on the perception was not affected in this case. Therefore, *it is not only possible, but there exist various ways in which to symbolize the same referent conceptually without affecting its accurate representation in any meaningful way.***

Joshua may not have *visually* shared the findings, but he did *verbally* share that they existed. Ellen, on the other hand, neither *visually,* nor *verbally* would share the entirety of her research findings by omitting the unexpected results, which the author would feel satisfies the criteria for falsification, as it relates to *failing to accurately represent one's research findings* (Public Health Service, 2005; Macrina, 2014). Therefore, many ways to accurately represent the conclusions from one's research exist and all of which in some way involve the alignment of multiple perspectives in order for the representation itself to be deemed accurate.

Discussion

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Accurate representation is determined based on what is perceived equating with what is presented, which itself is conveyed without modification or manipulation. Ultimately, accuracy in representation relies on the faculties of sensory perception that assess how closely what is perceived matches what was supposed to be presented, unaltered. That is, sight, sound, taste, touch, and smell are relied on for accuracy of representation, which consists of a) presenting something as it is unaltered, and b) perceiving something as it is presented in an unaltered state. Nevertheless, there is potential for both criteria a) and b) to be met, yet the representation to still be considered inaccurate. In other words, if what is presented is unaltered and what is perceived is what is presented, then what is perceived is unaltered. It is possible to perceive what is unaltered as different than it was presented. The only way to reconcile this is by acknowledging that the subjective and interpretive step of perception via the faculties serve as lenses through which accuracy is framed.

Because perception is required, the sense organs are responsible for what is interpreted matching what is presented unaltered. If malfunctioning, or otherwise influenced, then the determination of accuracy in representation may be affected by how the organs operate. Thus, regardless how an unaltered color image of objects that a researcher claims if red is presented, to someone suffering from deuteranomaly/protanomaly colorblindness (Color Blind Awareness Foundation, 2017) since the color does not exist he or she will always accuse the researcher of not accurately representing research findings, which is the definition of falsification (Macrina, 2014). Nonetheless, however unlikely the analogous scenario may be to occur, that it is possible for both unaltered presentation from the researcher's perspective and perception of the unaltered presentation by another not accurately representing what the researcher claims illustrate the potential difficulty in consistently determining cases of research misconduct.

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The only way to avoid problems is not to in any way modify what is being included. Nevertheless, cropping before inclusion results in a violation of *omission* that is difficult if not impossible to determine by anyone other than the guilty party. Although *omission* is as much a violation as is a *commission*, is it more acceptable because of the decreased likelihood of being caught? Moreover, it may be more important that what is omitted or committed is relevant. Was the *violation of commission* by Joshua pertinent to the research whole?

The written explanation that he provided may be adequate, and he did technically share, but the flagrant editing was not something that should have occurred. While Ellen's suggestion avoids the explanation, the cropping is still a *violation of omission* that is deliberate and results in alteration just as Joshua's action did. Both expected and unexpected results occurred in the same experiment and selectively deciding to include some, but not others, either by way of underexposing or cropping results is dishonest. Therefore, if Joshua is guilty of research misconduct by his actions, then Ellen's suggestion would be at least as characteristic of research misconduct as Joshua's. If the author had the opportunity, then he would warn Joshua that Ellen's suggestion is to be avoided at all costs because it is either significantly and qualitatively different, or it is not; if it is not different, then there is no justification for taking her suggestion over what he has done, but if the suggestion is different, then the author would advise Joshua either to present the entire image or nothing at all.

Conclusion

Having experience with a hypothetical case revealed some of the challenges that one encounters concerning suspected research misconduct. Transitioning to challenging circumstances related to a real individual should facilitate the process of refinement. Such fine-tuning will occur in the context in which the *violation imperative* can be tested and explained. It should be understood that there is often a lack of agreement on what constitutes instances of

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falsification and research misconduct even when there is evidence that the aspects of *violation imperative* have been satisfied. Nevertheless, an exercise consisting of a case involving aspects of *deliberateness*, *alteration, and inclusion* as well as a Nobel Laureate will be beneficial. That benefit will be that the use of a high-profile case serves to remind the reader that at every level professionally people are subject to issues of ethical misconduct involving the aspects of th**e** *violation imperative***.** The aspects of the violation imperative are all directly related to the actions of the researcher and were also determined to have the potential to influence both the research results and the determination of guilt. Having established the *Violation Imperative* of which any possible definition of falsification or research misconduct ought to be comprised at a minimum, in the next paper, Part III, we will consider the suspected research misconduct case of Robert Millikan as presented by Pritchard & Goldfarb (2016).

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