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External and Intrapsychic Factors Determining Unethical Behaviours and Controversial Practices in Science

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Abstract

From one side, investigators are expected to strive for reliability and trustworthiness in publishing scientific data; on the other, meeting the numerous research indicators of their professional work. In this article, various aspects of controversial practices concerning intentional skipping essential issues in a paper, hypothesizing after results, data improvement, and statistical and methodological tweaking are examined. The current paper proposes the holistic understanding of the causes of controversial practices includes the constellation of external factors in the context of the intrapsychic functioning of scientists. This approach gives a deeper insight into unethical behaviour mechanisms through the prism of needs, values, and personality traits. Self-enhancement values, narcissism, Machiavellianism, hubristic pride, as well as needs for competition, glory, success, self-esteem enhancement, obsessive passion, may provide fertile ground for unethical behaviour in science.

Keywords*: external and intrapsychic factors, research misbehaviour, controversial practices*

1. Introduction

The growth in the importance of science and attempts to use rating systems describing researchers' achievements resulted in a situation when an investigator was caught between the devil and the deep sea (Engel, 2015). A scientist has to declare more and more papers, grants, and patents to fulfil ever-growing requirements (Gruber, 2014). Thus, the requirements are in opposition to the definition of a scientist and the profession's ethics authors (Børsen et al.,

2013; Shamoo & Resnik, 2015). Unethicalness could be understood as either intention of engagement in specific actions or an attitude in participating in behaviors that transgress commonly accepted social, ethical standards (Rest & Barnett, 1986). Unethical behaviors encompass, among others, lie, fraud, theft, sabotage, and corruption. Besides, it could be exemplified by hiding inappropriate behavior of other persons, law and morality violation due to idleness and passiveness (Kish-Gephart et al., 2010). Ethics in the field of a scientist's work depends on the specificity of his activity and. The necessity of publishing an increasing number of articles results in the publishing of partial outcomes leading to the salami effect (Eva, 2017; Tolsgaard et al., 2019). To speed up the publishing process and not overstep the time limits of a project, scientists submit a paper to several journals and then withdraw it from the less prospective one (Jain, 2010; Karlsson & Beaufils, 2013). Plagiarisms, auto-plagiarisms, and publishing papers in several journals simultaneously are also relatively common practices used to increase published manuscripts (Luther, 2008). The other alternative method is exchange of favours between researchers including guest authorship and ghostwriting (Dadkhah et al., 2015; Oravec, 2019). However, an extreme practice is the fabrication or forging data (Fanelli, 2009).

For example, Resnik and Elliot (2016) pays attention to the choice of investigations, publishing and sharing results, and the meaning and consequences of the studies for society. An investigator should be aware of the responsibility for carried studies and understanding their broad consequences (Bektaş & Tayauova 2019). Currently psychologists develop treatment of patients according to practice-based evidence. What if scientific evidence bend the truth? In this article, it was reviewed current theories and studies that aim at explaining why researchers break ethical rules in scientific work and highlighted some controversial scientific practices leading up to publishing unreliable results. Furthermore, the article advocates taking a deeper look at what is behind research misbehavior including not only external but also intrapsychic factors (see Fig 1).

Figure 1. Factors influencing the unethical behaviour and controversial practices in science.

2. Lack of reliability or controversial practices? Scientists' peccadilloes

Reliability and trustworthiness in publishing scientific data do not depend on the ethics guidelines of scientific society (Johnsson et al., 2014). Ethical evaluation articles accepted for

publication is a function of morality and honesty of individual investigators. Reliability and trustworthiness in publishing articles are especially seen in the context of the so-called "controversial practices" in science. Although, morally ambiguous behavior is not directly indicated by publishers in authors' guidelines what is conducive to publishing unreliable results.

Hypothesizing after results are known (HARKing), data manipulation for their improvement, applying preliminary statistical analyses, and omitting significant but inconvenient issues in the manuscript are among these "controversial practices". Based on meta-analysis results, 33.7% of researchers confessed to such controversial practices (Fanelli, 2009). Again, as many as 72% of their colleagues committed such practices in the opinion of that investigators.

Hypothesizing After the Results are known as HARKing distorted scientific model (Kerr, 1998). The articles with HARKing show an idealized illustration of a phenomenon where a scientist correctly predicts complex results' patterns. Such a practice was identified among 19.8% of Danish scientists (Tijdink et al., 2016). One of the HARKing versions assumes not presenting hypotheses stated a priori and not fitting the obtained results. After reading an article, one may feel that a theory is too good to be true. The other variant of HARKing relies on presenting hypotheses not foreseen at the beginning of the study due to unexpected results. Thus, methodological slips are pretty common as the study was not designed to test new hypotheses. HARKing could be recognized by bed fit of procedures, poor methodological design, bad control variables, and inadequate selection of the group for the given study.

Many controversial decisions are made at the very beginning data preparation stages. The most frequently used modifications concern the collection of a smaller or larger amount of data than planned due to the lack of a significant effect, eliminating some observations (outliers), counting out some control variables, combining several measurements into another variable or data transformation to get significant effects. Such data pretreatment allow scientist to achieving false-positive results (Ioannidis, 2005; John et al., 2012).

The next step of data analysis, including statistical analysis, is even more sensitive to overstepping ethical standards. Even 4.7% of scientists admitted they selectively modified

data after performing analysis to obtaining significant effect (Tijdink et al., 2016). In some cases, the downwardly rounded p-value is presented. Common practice is conducting all possible statistics to take out any significant result from gathered data. The analyses may not fit investigated model (i.e., when in an experimental study, correlation or regression analyses are reported based on a single group or a combined group encompassing two separate groups). Simmons Nelson & Simonsohn,. (2011) evaluated how giving statistical and methodological tweaks related to (a) choosing dependent variables, (b) the number of participants or observations included in a study (sample size), (c) covariates incorporation, (d) data reporting by experimental subsets, affected false-positive results. The very shocking conclusions were made. It was shown that based on 15 000 computer simulations of experimental data, 61% of results could be false positives. The practices encompassing manipulations of favorable boundary conditions settings, dependent and independent variables, treatment levels, moderators, and mediators and others parameters settings to achieve a stable, significant, and overestimated statistical effect are called the voodoo correlations (Fiedler, 2011). The voodoo correlations is a problem of methodological ethics that may arise in all scientific paradigms.

Another controversial practice is a tendency to apply sophisticated statistical analyses to raise the value of manuscripts by scientists who do not necessarily understand the essence or need to meet the requirements of analyses. As a result, false but significant outcomes are presented. Tragicomic is when reviewers who are not specialists in statistics perform reviews and accept results presented in the manuscript (John et al., 2012; Simmons et al., 2011).

3. External factors

Considering reasons of unethical practices, economic, and organizational factors might be essential in the context of scientists' moral actions (Johnsson et al., 2014). Economic factors are associated with financial issues and employment stability, whereas organization aspects are connected to the inner organizational structure, standards, and rules of a scientific institution and working atmosphere.

Scientists' openness to knowledge is the crucial characteristic of investigators. It should ensure the independence of external factors (i.e., reporting line, government, politics). Aiming at the truth should not take into account such relationships but should be headed by objectivity. Unfortunately, the pragmatic need to conform to authority, university authorities,

or supervisors may be the reason for bending the rules. A scientist is a pawn trapped in a game, and all-encompassing pressure is a trigger factor of unethical behavior, heading to publishing many articles with high impact factors (Van Noorden, 2010; Burbules, N2015). Publish or perish is a well-known aphorism describing the state of affairs (Luther, 2008). Publishing is often a condition of holding down a job at universities on institutes and getting scientific degrees and titles (Carpenter et al., 2014). Thus, the pace of investigations and publishing results does not comply with methodological requirements of studies or responsibilities to show concern for developing procedures, but with the pressure for fast publishing to fulfil the requirements (Singh & Purohit, 2011). It is inconceivable that a scientist spends years running experiments without publishing results. A distraction to writing articles while an experimental study is conducted to prove one's productivity is a standard. The next problem a researcher has to cope with is publishing many papers in a limited time. There are many "Open Access" publishers on the market. They offer short terms of reviewing and publishing in exchange for an excessive price. As a result, the number of free-of-charge journals dramatically decreases. These circumstances developed strategies to balance funds for publishing, fulfilling inflated standards and requirements investigators have to face via controversial practices. Thus, the need to obtaining financing for publishing increases scientists' dependence on authority and universities authorities.

Especially indicative pressure of scientific institution is exhibited in raising grants and winning competitions for research projects. Investigators that succeeded in the rat races may expect extra profits from authorities as they raise the prestige of the university and its financial resources. Thus, there is a temptation to meet university authorities' expectations in exchange for future benefits in accelerating career. Unfortunately, such benefits are perverse incentives, resulting in opposite outcomes than presumed. Edwards and Roy (2017) demonstrated destructive effects of perverse incentives leading towards breaking ethical rules and controversial practices. The typical effect of the awarding of prices for grant funding is hiding and belittling adverse outcomes.

Furthermore, prices for the number of articles published may increase low-quality articles with slipshod methods and overestimated effects (Smaldino & McElreath, 2016). The financial advantage of professional advancement for the number of citations inevitably leads to doing little favor to a friend reflected in extending references list including colleagues papers (Oravec, 2019). Thus, it is not surprising that 71% of scientists are afraid of being

deceived by colleagues as to the performance measures mentioned above productivity indicators (Abbott et al., 2010). All the pressure methods exploited by scientific institutions form destructive organizational culture. Perverse incentives, decreasing funds for science, and increasing publishing pressure force unethical behavior on research to fulfil university requirements and save a job (Edwards & Roy, 2017).

4. Intrapsychic factors

People make decisions due to external factors and internal reflecting unrepeatable patterns of who they are. Morel decisions are dictated by intrinsic motives associated with our needs, a hierarchy of values we hold, and personality traits.

4.1.Values

In the moral context, particularly important are personal values as they form the identity and constitute the basis for the formation of attitudes that determine decision-making (Hitlin & Piliavin, 2004). Moreover, the ethical behavior of a person could be predicted based on the values structure (Watson et al., 2009; Kish-Gephart et al., 2010). Personal values are long-lasting and stable motivation objectives. They are universal and independent of a situation (Schwartz, 1992). They reflect principles and beliefs of what the person thinks is important in life (Rokeach, 1973). According to Feldman et al. (2015) the self-transcendence and conservation values hold a person against different forms of unethical behaviors. On the other hand, self-enhancement values, such as a need for achievement, power, and hedonism, are predictors of breaking the rules. Self-enhancement values are expressed by the pursuit of personal success, underlying own meaning, egocentrism, doing business at the expense of others, struggling to control, and dominancy (Schwartz, 2010). Pulfrey & Buter, (2013) reported that the pursuit of goals, power, and richness increased unethical behaviors. It turns out that motives focused on self-enhancement values are present in many statements concerning scientific career choices or starting Ph.D. studies (Gerasimova & Kryachko, 2019; Wellington & Sikes, 2007). In many instances, this is a way to think better of yourself and prove oneself at the highest level (Leonard et al., 2005). Austrian study revealed that postdoctoral students, while competing for a better position at the university, sacrifice their personal objectives to succeed in science (Fochler et al., 2016). The pursuit of achievements,

even at the cost of personal life and family, is enhanced by a work evaluation system based on the number of publications, citations, that is productivity.

4.2. Needs

At the basis of values directed towards self-enhancement via the pursuit of achievements and power underlie the need to be better than the others, competition, glory, success, obsessive passion, and self-esteem enhancement. The association between self-enhancement value through power and dominancy with an deficiency-needs for love and being loved was evaluated in Winston, Maher & Easvaradoss (2017) study. Self- enhancement via the pursuit of achievements was linked to being good enough at what person does, being better than the others in the expertise area, and failure. Indeed, the deficiency of feeling better than the others could be visible in competition between scientists in making discoveries and being the first in their publishing (Walsh, 2014). The need to showing superior scientific achievements is expressed in hyper-competition between scientists, revealing the dark side of scientific rivalry (Fochler et al., 2016). It influences their job and professional relationships contributing to unethical controversial actions, including sabotaging others' ability to use one's work, interference with peer-review processes, lack of openness to sharing information and methods (Anderson et al., 2007; Edwards & Roy, 2017).

A well-recognized need for success and glory is noticeable to the scientists and is known as intellectual celebrity syndrome (Winkler, 1987). Such a person pushes for applause by popularizing and publicizing its "discoveries". During oral presentations, pretentious words like I and Mine are present all too often. It prefers using anecdotes and metaphors instead of quotes or experimental outcomes. Scientific celebrity may lead to megalomania, overambitious, and a sense of supernatural power (Martinez-Conde et al., 2016). According to Diamandis (2013), these behavior and traits are particularly evident in some Nobel laureates who suffer from "Nobelitis" disease.

Carrying on studies for many scientists is not just a job but also a passion. Often, they may get lost in that job and their passion. The need for pursuit success is the reason for high involvement in the activity in the field of interests of the person. Passion is a strong tendency towards self-defining activity appreciated by a person who inclines to invest time and energy (Vallerand et al., 2003). That activity internalized in the identity may lead to a harmonious or

obsessive passion. In persons with harmonious passion, the activity takes a considerable amount of time away, significant but not overpowering space in the person's identity. Passion are balanced by various aspects of life (Sheldon, 2002). On the other hand, obsessive passion generates compulsion making it challenging to get away from thoughts about this activity because this activity defines her as a person. Through obsessive passion, people develop ego-based structures that help them manifest rigid persistence in action and achieve success (Hodgins & Knee, 2002). It was documented that obsessive passion leads to unethical behaviors when a person feels hubristic pride (Bureau et al., 2013). In contrast to authentic pride, hubristic one is manifested by distorted and self-aggrandized self-views, is strongly associated with narcissism and conditioned by low self-esteem (Miller et al., 2011; Pincus et al. 2009; Rogoza, et al., 2018; Tracy et al., 2009). The need for validating self-esteem through dominancy over others in the face of adversity underlies mediating the role of hubristic pride in the relationship of obsessive passion and unethical behaviors (Bureau et al., 2013). Low efficiency, a negative evaluation may in this case influence self-image and self-esteem, which is reflected in Ph.D. students and postdocs' comments (Engel, 2015**;** Leonard et al., 2005).

4.3.Personality traits

Kornfeld (2012) indicated that unethical behaviors in publishing are based on interactions personal traits and fears of failure, and temptation of perverse academic incentives. Research conducted on a large group of scientists from Denmark concerning impact of self-esteem, narcissism, Machiavellianism and psychopathy on research misbehaviors showed that only Machiavellianism predicts unethical behavior in science (Tijdink et al., 2016). Machiavellianism is a tendency towards behaviors that do not consider conventional morality directed on lying and cheating, focusing on own achievements and prioritizing own purposes. It explains the easiness of breaking the rules by scientists (O'Boyle, Forsyth, Banks & McDaniel, 2012). Both, publication pressure and academic position were mediators between relationship of Machiavellianism and research misbehaviors. Narcissisms and unethical research behaviors were more widespread among professors than Ph.D. students (Tijdink et al., 2016). It may suggests that narcissism and unethical behaviors give scientists preferences to achieve higher academic ranks (Tijdink et al., 2016). Interestingly, self-esteem and pressure for publishing were lower in group of professors than Ph.D. students. The presented results are consistent with Oflu et al. (2020) study, that indicated a negative relationship between vulnerable narcissism and subjective career success. In case of

insufficient external validation, the grandiose self-image of narcissists is threatened, leading to low self-esteem (Mille et al, 2011). Sensitivity to an external evaluation in the form of scientific indicators may favour unethical behaviors directed towards success achievement and admiration.

5. Conclusion

It is evident that scientists need ethics to distinguish a standard and a good practice in their profession, contrasting a forgery. Otherwise, they might have problems advancing in new knowledge, keeping reproducing existing approaches in exchange for gaining "scores." They may also face difficulties using results for others' benefits instead of personal aids and not hurt subjects to satisfy unrestrained scientific curiosity. Those mentioned above are only a few reasons why scientists should be aware of ethical standards during their entire professional career.

The growth in the importance of science and attempts to use rating systems describing researchers' achievements resulted in a situation when an investigator was caught between the devil and the deep sea. From one side, an investigator is expected to strive for the truth, from the other, meeting the requirements of numerous indicators of his professional work (Engel, 2015). A scientist has to declare more and more papers, grants, and patents to fulfil ever-growing requirements. Thus, the requirements are in opposition to the definition of a scientist and the profession's ethics. The necessity of publishing an increasing number of articles results in the publishing of partial outcomes leading to the salami effect. To speed up the publishing process and not overstep the time limits of a project, scientists submit a paper to several journals and then withdraw it from the less prospective one. Plagiarisms, auto-plagiarisms, and publishing papers in several journals simultaneously are also relatively common practices used to increase published manuscripts. The other alternative method is exchange of favours between researchers including guest authorship and ghost-writing. However, an extreme practice is the fabrication or forging data.

Tweaking scientific truth to meet the needs of efficiency indicators is conducted through controversial practices, including purposively skipping essential issues concerning a study in a paper or making hypotheses after accomplishing research. Relatively common is

statistical and methodological tweaking, including data manipulation called the ‘voodoo correlation’ and various practices allowing data improvement.

Researcher's unethical behaviour and controversial practices may have their causes in external as well as intrapsychic factors. The external factors are associated with financial issues, employment stability, inner organization structure, standards and atmosphere in the scientific institution, and involvement of perverse incentives. Intrapsychic factors favouring unethical practices are conditioned by the needs of self-esteem enhancement, competition, glory, success and, obsessive passion. Self-enhancement values of scientists aiming at achievement and power also should be taken into consideration. The whole is complemented by narcissism, Machiavellianism, and hubristic pride, the most frequent personality predictors of research misbehaviour.

Knowing the deeper causes of unethical practices, the question is how to create conditions for scientists to satisfy their needs without being forced to bend the truth? How to develop sensitivity to controversial practices in next generations of scientists? What system changes would be needed to deal with this problem in a non-superficial way? This is an area for the debate and the development of solutions by scientific bodies.

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Figure 1. Factors influencing the unethical behaviour and controversial practices in science.