



Feelings and Ethics Education: The Film *Dear Scientists*

Ioanna Semendeferi

Department of Physics, University of Houston, Houston, TX 77204

There is an increasing body of evidence that not only cognition but also emotions shape moral judgment. The conventional teaching of responsible conduct of research, however, does not target emotions; its emphasis is on rational analysis. Here I present a new approach, ‘the feelings method,’ for incorporating emotions into science ethics education. This method is embodied in *Dear Scientists*, an innovative film that combines humanities with arts and works at the subconscious level, delivering an intense mix of music and images, contrasted by calm narration. *Dear Scientists* has struck a chord across the science, humanities, and arts communities—a promising sign.

INTRODUCTION

According to recent neuroscience findings, emotions play a significant role in decision making, and feelings shape moral judgment (9, 3, 12, 2). The conventional teaching of science ethics, however, does not target emotions; its emphasis is on rational analysis of principles and facts and the understanding of rules and regulations. This leaves one wondering: Is it only awareness of the rules that makes scientists ethical or is it also their morality and capacity for empathy? I argue that issues of ethics should also be connected to the scientists’ emotional brain. Without cultivating the latter, the teaching of science ethics would not fully accomplish its purpose, which is the production of moral scientists with a ‘soul.’ A case can be made that over-emotionality is as bad as over-rationality; thus, a balance between the two is the key to success in science ethics education (11). How can an instructor cultivate noble feelings in scientists? Images and music may be one of the answers. The film *Dear Scientists* is based on this premise. It represents an innovative method to incorporate emotions into science ethics education by mixing in humanities and arts.

THE FILM *DEAR SCIENTISTS* AND THE “FEELINGS METHOD”

Evaluation of conventional teaching models in science ethics, collectively known as Responsible Conduct of Research (RCR), points to mixed results (1, 6, 13). Specifically, RCR instruction yields knowledge gains but appears to fall short in arousing feelings, cultivating empathy, and

reinforcing moral attitudes. A cohort of scholars now supports that emotions should play a role in ethics education (16, 14). There is also support in the literature for the emotional power of music and visuals and their effect on behavioral changes (5, 10, 7). In this direction, a few science ethics educators have incorporated some films and documentaries in their courses to good emotional effect (4). Films associated with landmark ethics cases are popular choices. These include: *And the Band Played On*, a film on the scientific infighting during the AIDS discovery; *Miss Evers’ Boys* on the role of Nurse Rivers in the Tuskegee syphilis experiments; and *Fat Man and Little Boy* on the making and dropping of the first atomic bombs. Lately, a new breed of interactive films exemplified by *The Lab* have made their debut; their sole purpose is to serve as educational material in science ethics courses.

The film *Dear Scientists* embodies a different method to incorporate emotions into science ethics education. It is neither a standard film with a plot nor a standard documentary sprinkled with interviews. The film advances an experimental genre that works at the subconscious level—‘the feelings method’—mixing music and visuals of continuous high intensity. The film’s strong images leave an indelible impression of scientists’ ethical and social responsibility, which is a key goal of science ethics education. These visuals either create or refresh memories about the making of science. There is intermittent narration with a contrasting calming tone that helps bring the viewer to a meditative state.

Aside from the value of the arts in science ethics education, central to the film’s message is also the value of humanities, especially dramatic cases drawn from the history of science. Through the lenses of the past, scientists can experience the consequences of unethical actions. By putting their feet in the protagonists’ shoes, scientists get a sensory experience of what it means to be unethical. Furthermore,

Corresponding author. Mailing address: TIMES, Health and Biomedical Sciences Center (HBSC), Room 338, 4811 Calhoun Rd., University of Houston, Houston, TX 77204-6022. Phone: 713-743-3544. E-mail: isemendeferi@uh.edu.

scientists realize some underlying commonalities in human behaviors now and then, despite regulatory progress. This realization brings home an important message: There is continuation in human predispositions, and thus, there is no way to build a better future without drawing wisdom from the past.

The visuals of the film include classroom shots, laboratory imagery showing scientists at work, archival stills, and allegoric scenes. The scientists appearing in the film have diverse ethnic backgrounds, manifesting science's global character. Lasting about 25 minutes, the film allows time for discussion in a standard class session, where different interpretations of its metaphors can be brought up and analyzed. The film's ultimate goal is to change the viewer's attitude toward science ethics from that of neglect or reservation to one of active participation.

In addition to introducing "the feelings method," the film is meant to serve as Part I in a series of short films that are forthcoming. All subsequent episodes will follow the same method. With an artistic touch, the series will present the historical cases mentioned in Part I and connect them with present issues and realities. The cases that Part I briefly introduces are: a) The Manhattan Project and the making of the first atomic bomb; b) the human radiation experiments; c) the civilian nuclear power debate and the accident at Three Mile Island; d) the Tuskegee syphilis experiments; e) the Challenger disaster at NASA; f) the tobacco hazard; and g) the case of lead poisoning.

Many of the film's allegoric scenes feature Clio, the muse of history who is transformed to the muse of history of science and eventually to the ideal ethics instructor. The empty chair in the theater stage represents the need for empathy in the making of science. The young couple represents the future of humanity, embodies empathy and love, and exposes the vulnerability of the public to negative effects of certain techno-scientific and medical endeavors. The male-female dancing also represents the coupling of rationality with emotions. In some—although not all—of the film's visuals, male actors 'represent rationality' and female actors 'represent sentimentality.' We have reached a point in the history of humanity where scientists, irrespective of their gender, should learn to embrace their feelings and 'feminine' side. Emotions are not necessarily a weakness in the making of science. Actually, some positive emotions can save the world by helping to overcome barriers of cultural cognition, which appear resistant to rational arguments (8, 15). The theatrical scenes with the masks represent the drama of compromise in scientific endeavors, while the blindfolded scientists represent the limited connection with reality caused by bias.

The above interpretations by no means exclude other understandings that the viewer may come up with. The film's aim is to unite people with different viewpoints and perspectives, provoke them, and motivate them to discuss and find solutions. The arts, especially the visual and dramatic arts, should play a significant role in issues of science ethics. Being

predominantly an emotional endeavor, the arts can bring together humanities, science, engineering, and medicine in challenging discussions on morality.

CONCLUSION

Fusing humanities with arts, the film *Dear Scientists* is an open letter to the scientific community and aims to sensitize its members. It raises questions and provokes thought. The term 'scientists' is used broadly referring not only to scientists, but also to engineers and medical experts.

Humanity is central in this film and the difference individual scientists can make for its sake is one of the film's main points. Although the latter may sound simplistic, there is no doubt that in a democracy everybody bears some responsibility when things go wrong. The same applies to science. The film brings the viewer to a meditative state in order to register this truth.

Qualitative feedback from the science, humanities, and arts communities in the multiple festival and conference screenings of the film has been highly positive. Naturally, this feedback has to be complemented with quantitative evaluation, whose value in science ethics scholarship is repeatedly emphasized in this volume's essays. This is part of my ongoing efforts along with the preparation of the remaining films in this collection.

More information about the film can be found at its official website, which includes a two-minute trailer: www.dearscientists.org.

ACKNOWLEDGMENTS

This article is based upon work supported by the National Science Foundation (NSF). Any opinions, findings, and conclusions or recommendations expressed in this article are those of the author and do not necessarily reflect the views of the NSF. I thank Ioannis Pavlidis who encouraged me to pursue my film project and was instrumental in helping me getting access to various laboratories, where some of the film's scenes were shot. Moreover, I thank my film crew, actors, and volunteers, as well as all the institutions that helped me in the filmmaking. Last but not least, I thank Michael Zigmund, Beth Fischer, and Fred Grinnell for inviting me to submit my perspective to this special volume and for their thoughtful comments. The author declares that there are no conflicts of interest.

REFERENCES

1. Antes, A. L., X. Wang, M. D. Mumford, R. P. Brown, S. Connelly, and L. D. Devenport. 2010. Evaluating the effects that existing instruction on responsible conduct of research has on ethical decision making. *Acad. Med.* 85(3):519–526.
2. Brosch, T., K. R. Scherer, D. Grandjean, and D. Sander. 2013. The impact of emotion on perception,

- attention, memory, and decision-making. *Swiss Med. Wkly* **143**:w13786.
3. **Damasio, A.** 2008. *Descartes' error: emotion, reason and the human brain.* Random House, New York, NY.
 4. **Essigmann, J. M.** 2012. Addressing the need for templates for teaching responsible conduct of research at a research university. *Teach. Ethics* **12(2)**:83–86.
 5. **Fox, S., Y. Amichai-Hamburger, and E. Evans.** 2001. The power of emotional appeals in promoting organizational change programs. *Acad. Manage.* **15(4)**:84–95.
 6. **Funk, C. L., K. A. Barrett, and F. L. Macrina.** 2007. Authorship and publication practices: evaluation of the effect of responsible conduct of research instruction to postdoctoral trainees. *Account. Res.* **14(4)**:269–305.
 7. **Juslin, P. N., and J. A. Sloboda.** 2001. *Music and emotion: Theory and research.* Oxford University Press, Oxford, UK.
 8. **Kahan, D. M., H. Jenkins-Smith, and D. Braman.** 2011. Cultural cognition of scientific consensus. *J. Risk Res.* **14(2)**:147–174.
 9. **Koenigs, M., et al.** 2007. Damage to the prefrontal cortex increases utilitarian moral judgments. *Nature* **446(7138)**:908–911.
 10. **LaMarre, H., and K. Landreville.** 2009. When is fiction as good as fact? Comparing the influence of documentary and historical reenactment films on engagement, affect, issue interest, and learning. *Mass Commun. Soc.* **12(4)**:537–555.
 11. **McCuen, R., and G. Shah.** 2007. Implications to ethics education of recent neuroscience research on emotions. *J. Leadership Studies* **1(3)**:44–56.
 12. **Pfister, H. R., and G. Böhm.** 2008. The multiplicity of emotions: a framework of emotional functions in decision making. *Judgment Decision Making* **3(1)**:5–17.
 13. **Powell, S. T., M. A. Allison, and M. W. Kalichman.** 2007. Effectiveness of a responsible conduct of research course: a preliminary study. *Sci. Eng. Ethics* **13(2)**:249–264.
 14. **Sunderland, M. E.** 2014. Taking emotion seriously: meeting students where they are. *Sci. Eng. Ethics* **20(1)**:183–195.
 15. **Taebi, B., S. Roeser, and I. van de Poel.** 2012. The ethics of nuclear power: social experiments, intergenerational justice, and emotions. *Energy Policy* **51**:202–206.
 16. **Thiel, C. E., et al.** 2013. Case-based knowledge and ethics education: improving learning and transfer through emotionally rich cases. *Sci. Eng. Ethics* **19(1)**:265–286.