

“Dissecting Bioethics,” edited by Tuija Takala and Matti Häyry, welcomes contributions on the conceptual and theoretical dimensions of bioethics.

The section is dedicated to the idea that words defined by bioethicists and others should not be allowed to imprison people’s actual concerns, emotions, and thoughts. Papers that expose the many meanings of a concept, describe the different readings of a moral doctrine, or provide an alternative angle to seemingly self-evident issues are therefore particularly appreciated.

The themes covered in the section so far include dignity, naturalness, public interest, community, disability, autonomy, parity of reasoning, symbolic appeals, and toleration.

All submitted papers are peer reviewed. To submit a paper or to discuss a suitable topic, contact Tuija Takala at [tuija.takala@helsinki.fi](mailto:tuija.takala@helsinki.fi).

## *Disgust in Bioethics*

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### **Introduction**

Within the last two decades, there has been an increased interest in the emotion of disgust in moral philosophy and moral psychology.<sup>1</sup> A significant part of this discussion has focused on exploring the content of this emotion and on determining what its proper role should be in law and public policy. Of particular concern in many of these works has been the role of disgust as a response to serious moral transgressions. Of course, the belief that there is a connection between disgust and morality is not new. Already in 1927, Aurel Kolnai linked disgust to a certain moral sensibility and the perception of moral wrongs.<sup>2</sup> Likewise, Patrick Devlin, famously—or infamously—defended the thesis that disgust has a relevant role in determining what kinds of conduct society should tolerate or reject.<sup>3</sup>

Bioethicists have not been immune to interest in this emotion. Indeed, a review of the bioethics literature over the last two decades shows an increased use of disgust in dealing with biotechnological advances.<sup>4</sup> Usually, the debate over disgust in bioethics has been presented as one between so-called conservative bioethicists, who have seen disgust as a useful emotion when rejecting particular technological advances,<sup>5</sup> and so-called progressive bioethicists, who have tended to find disgust useless in assessing moral issues related to science and technology.<sup>6</sup> But, as is often the case, things are more complicated than this type of label dualism suggests. Indeed, in contrast to the debate within moral psychology and moral philosophy, much of the debate about disgust in bioethics has taken place without careful attention to the emotion and its

different uses. The result has been a back-and-forth discussion that has not contributed significantly to the moral discourse in bioethics.

We propose to advance this dialogue by clarifying the different ways in which disgust is used when dealing with bioethical issues, particularly those issues that relate to new biotechnological developments. We argue that discussions involving this concept are muddled because of a failure to clarify the particular content of the emotion and its manifestations, or because disputants are using disgust in different ways. We identify here four main uses of the concept of disgust. In some cases, disgust is used as an example to illustrate the proper role of emotional sensibility in bioethical thinking. In other cases, disgust is discussed as a possible source of moral knowledge that can help us discern the permissibility of biomedical practices or technologies. Disgust is also used as a rhetorical device to bring forth opposition or rejection of such practices or biotechnological advances. Finally, disgust is used in the bioethics literature as a tool that, on grounds of irrationality or ignorance, allows one to dismiss the concerns of those who appeal to disgust when rejecting new biomedical technologies. Of course, the different uses of disgust are interrelated, and sometimes more than one of these uses is found in the same work. We believe however, that these diverse uses have different normative implications, and thus it is important to clarify what it is that one wants to achieve when using the concept of disgust.

### **Disgust as an Illustration of the Importance of Emotional Sensibility in Bioethical Thinking**

Few would deny that most bioethical debates, from the moral permissibility of assisted suicide, to the desirability of

reproductive cloning, or to the appropriateness of allocating organs to alcoholics, are emotionally charged. And yet, with some notable exceptions,<sup>7,8,9,10</sup> emotions have rarely been carefully examined or their role evaluated in mainstream bioethics. Indeed, some have complained that in its search for freedom and respect for rights, bioethics has lost sight of the link between the emotions and intellect.<sup>11,12</sup> Bioethics has generally seen the emotions as antithetical to reason and has tended to focus instead on issues of cognition and rationality. Some commentators pay lip service to the value of the emotions,<sup>13</sup> but ultimately, the perspective of the inescapably affective mind, now supported by neuroscience, has rarely been truly acknowledged.<sup>14</sup>

The neglect of the emotions has begun to be challenged recently. And interestingly enough, the particular emotion that has been at the center of a new concern with the importance or irrelevance of the emotions when dealing with bioethical issues is that of disgust. To a great extent, the relevance of disgust in the discussion over the role and significance of emotions in bioethics resulted from the influence of Leon Kass's article "The Wisdom of Repugnance."<sup>15</sup> Although, as we discuss later, Kass's focus was on defending disgust as a source of moral wisdom, his article was quite germane to the issue of whether mainstream bioethical discourse was failing to appreciate the importance of the emotions in moral reasoning.

Although most of the responses to Kass's article have tended to accept the prevalent idea in bioethics that emotional responses are at best unreliable guides to moral decisions and at worst dangerous irrational reactions,<sup>16</sup> this discussion had the effect of bringing the role of emotions to the forefront of the debate. By calling attention to the role of disgust in bioethical decisionmaking,

Kass forced commentators, whether for or against a practice, to explicitly focus on the role of emotions.<sup>17</sup>

But the bringing of disgust into the debate about the importance of the emotions had an additional effect: it invited questions about what role the emotions actually play or should play in moral judgments about new biotechnological advances. Hence, in a well-known article, Mary Midgley explicitly argues that feeling is not only desirable but “an essential part of our moral life.”<sup>18</sup> Defending a, broadly understood, cognitivist view of the emotions,<sup>19,20</sup> Midgley uses disgust to argue that the common way of presenting the discussion over the moral status of biotechnologies as cases of conflicts between reason and emotions is misguided. Contrary to what many bioethicists appear to believe, she claims, feelings always involve thoughts, even if these thoughts are not always completely clear. Similarly, reasons are incorporated into peoples’ responses to particular types of feelings.<sup>21,22</sup> Thus, rather than being a sign of irrationality, the widespread disgust that many biotechnological advances elicit, Midgley notes, is an indication of thoughts that need to be considered and appropriately addressed.

More recently but in a similar vein, Gregory Kaebnick also uses disgust to call attention to the role of the emotions in morality.<sup>23</sup> For him, as for Midgley, the idea of a purely rational approach, that is, an approach that excludes emotions from moral judgment, is an oxymoron. He argues that emotions are significant sources of moral insight rather than a suspect way of approaching moral issues. Therefore, if it is true that emotions play an important moral role, Kaebnick holds, human beings should be quite reluctant to dispense with emotions like disgust.

However, the use of disgust to bring to the forefront the importance of

reflecting on the role of emotions presents us with some challenges. Clearly, from the fact that emotions can play a significant role in bioethical judgments, nothing follows about whether disgust specifically is trustworthy and an adequate moral guide. Indeed, those who, like Midgley and Kaebnick, see the emotions as relevant in moral decisionmaking believe that disgust—like other emotions—needs to be examined and must often be contested. Even when they believe that disgust functions as an enabling cause of moral reasoning, directing our attention to certain issues that should be looked into more closely, they hardly see it as a moral guide to follow unquestionably. Obviously, their accounts help sketch an overall picture of the role of emotions in bioethical reasoning and to that extent they contribute to the general discussion on emotions and morality.

Nevertheless, their use of disgust to exemplify their general point about the emotions is problematic. By using disgust as the emotion of choice, Midgley and Kaebnick appear to assume that if it is reasonable to say that emotions are crucial in moral reasoning, and that they may play a positive role in morality, then it is also reasonable to say that specific emotions like disgust may play such an important role. But to show this, more is needed. Even if one accepts that emotions are not mere feelings, that they have an intentional object, and that they constitute a way to look at the world, it is still possible to argue, as some have, that some emotions are always morally suspect.<sup>24</sup> In the case of disgust, it may be that as a quick response to a perceived threat, it can be particularly powerful in promoting moral deliberation. However, because of its content involving ideas about contamination and debasement, its tendency to want to withdraw from or reject the disgust-eliciting object,<sup>25</sup> and its historical use in discriminating against disadvantaged groups,<sup>26</sup>

disgust might not be a particularly appropriate emotion to use as an illustration of the relevance of the emotions in bioethical decisionmaking.

But opponents of the emotions in morality seem to have made this same mistake. They appear to believe that the alleged inadequacy of disgust is a good reason for concluding that emotions in general are inappropriate as moral guides. But just as from the fact that emotions in general are relevant in moral judgments nothing necessarily follows about the role of a particular emotion, from the fact that disgust is a particularly problematic emotion that raises special issues of irrationality and moral inadequacy nothing follows about the relevance of emotions in general. Clearly, it is possible to be receptive to the importance of emotions in moral reasoning, while at the same time rejecting the possibility of a positive role for disgust altogether.

Thus, although the use of disgust in the bioethical discussion has had the arguably pertinent effect of calling attention to the importance of reflecting on the role of the emotions when making decisions about biotechnological practices and technologies, it may not have been the best emotion to use in such a discussion. Because of its problematic content, disgust seems ill suited either to support the importance of the emotions in morality or to reject their value.

### **Disgust as a Source of Moral Knowledge**

“Shallow are the souls that have forgotten how to shudder,” Leon Kass states in his widely discussed article on the moral impermissibility of cloning.<sup>27</sup> In fact, Kass’s famous linkage of disgust to wisdom is not a particularly novel idea. For several decades, within moral philosophy, thinkers have been defending a correlation between disgust and

a certain moral sensibility that gives us insight into moral decay, corrupt character, debasing behaviors, or the violation of important taboos.<sup>28</sup> The majority of these authors, however, hold a cognitivist view of disgust according to which this emotion is a source of moral vision because it is constituted by a judgment or a belief about the way the world actually is. But for Kass disgust expresses moral wisdom even if this is an immediate, intuitive reaction that cannot be articulated rationally.<sup>29</sup>

Within bioethics this use of disgust as a source of moral wisdom has been contested on a number of grounds. Some have pointed out that we must be reluctant to attribute wisdom to an instinctive human response like disgust, for the reaction might actually be arbitrary and therefore unreliable.<sup>30,31</sup> For others, the mere fact that people may feel a “visceral unease” at some biotechnological advances does not mean that such unease is justified.<sup>32,33,34</sup> Others argue that even if emotions can be moral guides, disgust is not a particularly wise emotion;<sup>35</sup> on the contrary, they believe that it is often either based on morally problematic prejudices<sup>36</sup> or simply expresses biases against something that is not well understood by the evolved intuitive systems of causal reasoning.<sup>37</sup> Given this understanding of disgust, it makes sense to wonder whether disgust “emerges from wisdom or folly.”<sup>38</sup>

Despite the sometimes heated debate between those who defend the epistemic role of disgust in discussions about biotechnology and those who reject it, engagement with the issue of what kind of emotion disgust really is, how it operates, and what its cognitive components may be has been lacking.<sup>39</sup> Unfortunately, because disgust is a complex emotion, debates about its wisdom that fail to consider what type of emotion disgust is are unlikely to be productive. Indeed, the persistence of the controversy over

the wisdom of disgust may actually stem from conflicting understandings of the emotion.

Disgust is a complicated aversive emotion with an evaluative and a behavioral component expressed in a strong sense of withdrawal from, or rejection of, the disgust-eliciting object. A well-known theory of disgust considers it to be originally a food-related emotion that is linked to human beings' ambivalence about embodiment and animality.<sup>40,41</sup> In this view, basic or core disgust originated as a form of rejection of foods and other dangerous and offensive substances. Its main purpose was to ensure people's cautiousness about what they touch or eat, thus offering survival benefits. Through cultural evolution, this emotion later evolved beyond simply physical survival to address different problems and was appropriated by a wider range of elicitors.<sup>42,43</sup> Some of these elicitors include objects with properties that are usually associated with bodily and animal products. Because such objects remind people of their animal nature, they trigger what is known as "animal reminder disgust." But people's disgust can also be elicited by serious moral transgressions seen as a kind of moral pollution, for instance, particularly gruesome murders or corrupt politicians. Accordingly, sociomoral disgust acts as a "guardian of human dignity in the social order."<sup>44</sup> Thus, disgust can function to protect against harm to the body, to maintain interpersonal boundaries, and to shape our moral codes.

Although these different disgust domains are unacknowledged in the bioethical discussion, they are useful in understanding some of the positions in the debate. For example, although not explicitly stated, Nicholas Agar's view that disgust can be morally meaningful in the context of the debate on genetically modified foods appears to be

based on the idea that core disgust, that is, the disgust at eating something that may be dangerous or unnatural, must be given some moral weight.<sup>45</sup> Kass, however, is ostensibly arguing for the moral relevance of disgust when dealing with what he sees as serious moral transgressions. Thus, for him, disgust is appropriately used to draw moral lines for actions that are not necessarily related to food or other contaminating objects. Agar then seems to disagree with Kass on the relevance of disgust when dealing with aspects other than those related to food. And this disagreement on the value of disgust might be explained by the fact that both of them are appealing to different manifestations of this emotion.

Nonetheless, the lack of clarity on the different aspects of disgust is even present in Kass's own analysis. Although his main concern is with moral disgust, disgust that is elicited as a response to serious moral transgressions, it is not clear that all the examples he gives are cases of sociomoral disgust. Some of the actions he finds disgusting include not only cloning but also having sex with animals, mutilating a corpse, and eating human flesh. Although it might certainly be the case that these are disgusting activities, it is evident that not all of them elicit the same kind of disgust. Because of its relation to animal bodies, having sex with animals is arguably eliciting animal reminder disgust. Similarly, the disgust produced by the eating of human flesh is likely to be core disgust, a repugnance elicited by foods that are dangerous or unnatural. Although the disgustingness of these activities might involve a morally relevant aspect, an argument is needed to make such a case. Thus, without additional argumentation, one need not see revulsion at bestiality or at ingesting human flesh as involving moral concerns. Of course, it could. Disgust could show concern for animals' well-being,

or a concern with respecting human cadavers. But it could simply be a gut reaction to eating something that might pose a threat to our health or to the mixing of animal fluids. If this is correct, then whether disgust is morally relevant, and thus whether it might have some wisdom in these cases, depends on considerations other than its mere presence, as often the presence of disgust has no moral significance. Lack of attention to the different ways in which disgust appears, and their different moral implications, is likely to contribute to disagreements about whether there is any wisdom in repugnance.

A different but related problem for those who use disgust as a source of moral knowledge or lack thereof is the problematic understanding of this emotion. The view of disgust as unreflective and merely reactive, which both sides of the debate appear to presuppose, makes a sophisticated discussion about the wisdom of disgust difficult. Clearly, this view of disgust presents those who want to defend its wisdom with a serious problem, for they are unable to solve the tension between the unreflective, gut feeling aspect of the emotion and its alleged wisdom. Kass, for example, claims that disgust is morally significant while apparently placing it beyond reason's reach and morally wise even if primitive and nonrational. Indeed, according to Kass, even when the value conveyed by the emotion itself may not be easy to articulate, this emotion is sufficient to justify the moral rejection of a number of biotechnological practices. Not surprisingly, those who see disgust as a nonrational gut reaction do not question Kass's non-cognitivist approach to the emotion. Instead they simply point out that because disgust is a visceral feeling, an automatic reaction, it seems inappropriate, and perhaps dangerous, to talk about its wisdom.

This simplistic understanding of disgust is, however, far from an accepted view and is in fact incompatible with the position that most researchers on the emotions in general and disgust in particular endorse. It is true that not everybody agrees with the link mentioned earlier between disgust and food rejection.<sup>46</sup> However, because disgust is seen not as purely sensory and unreflective but rather as an expression of a judgment or appraisal that something is offensive and base, there is a general agreement that at least some forms of disgust can play an intelligible role in explaining our moral judgments. So much so that in moral philosophy disagreements regarding the moral wisdom of the emotion generally revolve around what its cognitive component is telling us and whether one should find it an appropriate moral guide, rather than on whether it has cognitive components in the first place.<sup>47,48</sup>

Given the abundance of research on disgust, it is not easy to justify a debate that presupposes a very simplistic account of this emotion. Moreover, given the ubiquity of this emotion in discussions over biotechnological advances, it is difficult to understand why both critics and supporters of disgust as a source of moral wisdom have failed to clarify what they mean when they refer to disgust. Although clarity may not necessarily lead to agreements, it will allow us to see precisely where the main disagreements lie.

### **Disgust as a Rhetorical Device to Engender Opposition**

A different way in which disgust is used in bioethics takes advantage of its behavioral manifestation: the tendency to distance oneself from the offending object.<sup>49</sup> Not surprisingly, the rhetorical use of images that elicit disgust is a



powerful—and often very effective—strategy when attempting to bring forth opposition to or rejection of some practice, object, or group. Indeed, disgust has been used historically as a tactic to exclude and discriminate against particular groups and persons. Jews, women, and homosexuals have been the target of this rhetorical use of disgust; painted as paradigms of the basely animal, they have been subordinated and separated from those they would purportedly contaminate.<sup>50</sup>

In the bioethical discourse, the rhetorical use of disgust has been directed not against people or groups but against certain biotechnological advances and practices. As we have seen, disgust is conceptually associated with purity, contamination, and transgression of boundaries. Hence, human enhancement, genetically modified foods, chimera research, and xenotransplantation have been targeted as especially susceptible to eliciting disgust and thus rejection. Descriptions and visualizations of mixed human-animal body parts, bloodied organs, spoiled milk, strange-looking foods (frankenfoods), odd-looking hybrid animals, and science fiction scenarios are common rhetorical devices used by opponents of these biotechnologies in order to elicit disgust from the public.<sup>51</sup> By pairing biotechnological practices with references that already elicit unease and disgust, those practices themselves become the objects of disgust. In some cases, such as those of chimera research, or xenotransplantation, disgust appeals to an animal reminder disgust and to fears about transgression of physical and moral boundaries between different species, particularly between humans and animals.<sup>52,53,54</sup> In other cases, such as that of genetically modified foods, the depictions of strange-looking foods appeal to the core sense of disgust already discussed.<sup>55</sup> In both cases, though, there is

a common goal: the audience should feel horrified and reject the practice or technology in question.

It is not that those who make use of disgust as a rhetorical device do not present any rational arguments to justify their opposition to particular biotechnologies. In general, they offer prudential and moral considerations based on the uncertainty about consequences, ask that human beings balance the moral costs and benefits from biotechnological interventions rather than accepting them uncritically, and urge that their potential advantages be compared with the attainment of other human goods.<sup>56</sup> However, their use of disgust as a rhetorical device attempts simply to appeal to a visceral reaction that many people have when confronted with new biotechnologies. It is taken to be immediate and intuitive, a gut reaction that intends to bring to the fore central and deep moral concerns that cannot be captured by deploying reason alone.<sup>57</sup>

Disgust is thus valuable because it can easily be used to send a message about the transgression of values that are thought to be essential to human beings. When debating biotechnological advances, this rhetorical use of disgust has a particularly important characteristic: even if accompanied by rational arguments, such arguments do not appear necessary. The starting point is the idea that the moral appropriateness of the emotional reaction is unquestioned because it is presumed to protect something of incomparable moral value. Moreover, the response that disgust elicits is often powerful enough to trump other moral considerations, even if it is not possible to articulate exactly why.<sup>58</sup> In this rhetorical use of disgust, then, the value of the emotion is made to depend not on a cognitive component, which would allow an evaluation

of the emotional response as rational or irrational, but rather on how successful it is in making people reject certain allegedly morally shady practices.

Because this use of disgust attempts to bypass careful reflection of one's moral beliefs, it is particularly problematic when dealing with matters of public policy. Indeed, one need not reject the importance of emotions in moral discourse or believe that emotional responses are irrational in order to be wary of this use of disgust. And one can recognize the force of emotional appeals when trying to move people to support or oppose particular practices and still ask whether such appeals are legitimate when debating important issues about public policy. One can concede that our gut reactions might be signs calling attention to values that could otherwise go unrecognized, or to advances or issues that deserve further reflection, without agreeing that such visceral reaction is a reason itself to accept or reject a practice or technology.<sup>59,60,61</sup> Feelings of disgust or repugnance can serve as initial clues that a moral concern might be present. But such feelings need to be accompanied by reasons. Of course, it can be the case that people might have difficulties giving reasons to support their gut reactions in response to new biotechnologies, or that the reasons they give are not particularly sound.<sup>62</sup> But from these facts one cannot infer that no reasons, indeed no good reasons, can be offered to support our emotional reactions of repugnance. Moreover, questions about what biotechnologies should be developed and implemented involve matters of public policy. Thus, attempting to generate dialogue, promote reasoning, and carefully examine a variety of relevant aspects rather than simply endeavoring to engender visceral rejection or approval of such biotechnologies is arguably more respectful of democratic ideals.

### **Disgust as a Tool to Dismiss the Concerns of Others**

But if disgust can be rhetorically used to elicit opposition to particular biotechnological practices, it has also often been used by those more sympathetic to biotechnology as a way to signal the irrationality and ignorance of others. As we have seen, biotechnologies such as cloning, chimera research, xenotransplantation, genetically modified foods, or synthetic biology are often met with a sense of repugnance by the public.<sup>63</sup> Usually, this is expressed in a variety of ways, from claims about the unnaturalness of reproductive cloning or vegetables with fish genes, and protests about playing god or accusations of hubris, to distinctive facial expressions of repugnance.<sup>64</sup>

Critics take these responses to be a mark of "irrational overreaction"<sup>65</sup> and, therefore, as grounds for discounting the concerns they express. Many who argue against taking these vague expressions of disgust seriously complain about the unreliability and arbitrariness of gut reactions.<sup>66</sup> Similarly, opponents of appeals to disgust remind us that many biotechnology developments now enthusiastically embraced, such as blood transfusions, reproductive technologies, and organ transplants, were initially met with queasiness by the public.<sup>67</sup> They also tend to believe that the reaction of disgust stems from public ignorance and that giving the public more information about particular biotechnologies and their benefits will increase scientific understanding and public support.<sup>68,69</sup>

There are a number of operative assumptions here. First, these critics assume that rationality is on the side of biotechnological advances. This, of course, does not mean that those who reject appeals to repugnance as irrational are uncritical of scientific and technological advances. But in general, they profess a critical



optimism that requires careful attention to the risks and benefits of new biotechnologies.<sup>70</sup> A second assumption present in discussions rejecting appeals to disgust is that there are appropriate and inappropriate ways to criticize science and that appropriate criticism must be grounded on concerns about harms to people, risks to health, benefits to human well-being, and the like. Third, critics also assume that scientific knowledge is understandable in principle by everyone, and that the science leads straightforwardly to a moral position. If the public rejects particular scientific or technological advancements—by professing some sense of moral disgust toward them—this is because there is a deficit in scientific understanding. The solution is to rectify this deficit by offering the public adequate scientific knowledge. Once the public acquires relevant knowledge, it will come to embrace biotechnological advances or, at least, be critical of such advances by attending to the balance of risks and benefits.<sup>71</sup>

Appeals to disgust are thus taken as irrational because they fail to give appropriate reasons for rejecting or opposing particular biotechnologies or because such appeals fail to attend to what is thought the appropriate way to evaluate biotechnological advances, that is, the risks and benefits of particular innovations.<sup>72</sup> There are however several problems with these arguments. First, dismissing appeals to disgust as a sign of irrationality can lead to disregarding legitimate concerns from the public simply because they are not presented in what are thought to be appropriate or rational ways to articulate ethical concerns. Expressions of disgust are often underlined by considerations about a lack of intellectual humility and institutional accountability on the part of scientists and policymakers. As some studies suggest, these indistinct appeals to a sense of moral repugnance voice the

need to recognize the uncertainty involved in risk evaluations of new technologies and the possible limitations of even the best available data and analysis.<sup>73,74,75</sup> Clearly it is unlikely that we will ever have the ability to fully predict and control the consequences of our scientific and technological decisions. Hence opposition to biotechnologies on grounds of moral repugnance can also amount to a value judgment about the quality of scientific and political institutions that fail to publicly discuss issues of responsibility for the inherent limitations of the knowledge they produce and defend. Appeals to disgust can also communicate the need to attend to the ethical significance of the environment and animal well-being.<sup>76,77,78,79</sup> Finally, these appeals can convey the importance of paying attention not just to the means we use to achieve particular ends, the main concern of some critics of appeals to moral repugnance,<sup>80</sup> but also to the ends we presumably want to attain and to the relationships between means and ends. One might certainly disagree with these concerns, but to dismiss them as simply irrational, political, or ideological presupposes a skewed understanding of rationality.

Second, using appeals to disgust as a way to dismiss opposition to particular biotechnologies as irrational is grounded on problematic beliefs about the relationships between ethical values and scientific knowledge. As mentioned earlier, it is not unusual for those who rebuff appeals to moral disgust as irrational to claim that these appeals are best dealt with by providing more accurate and accessible scientific information to the public, based on the belief that a more knowledgeable public will arrive to a particular moral conclusion. But this conception about the relationships between ethical concerns and scientific knowledge grants science a privileged position in the shaping of a supposedly

educated public. Moreover, it makes rejection only, not acceptance of scientific and technological advancements, the result of misunderstandings or of a lack of relevant knowledge. It does seem to imply that acceptance of biotechnological advances cannot result from ignorance.

Nonetheless, this tidy correspondence between acquisition of scientific knowledge and acceptance of new biotechnologies—or again a presumably sound opposition grounded on concerns about safety and the like—is not supported by the evidence. Indeed, studies show that the relationships between people’s attitudes toward biotechnologies and scientific knowledge are quite complex. Value predispositions, media claims, beliefs about scientific authority, concerns about institutional trust—all of them reinforce or moderate the effects of scientific knowledge on people’s attitudes toward science and technology.<sup>81,82,83,84,85,86</sup> Ethical concerns intermingle with scientific knowledge and with how such knowledge is understood. Hence to use invocations of moral disgust as a reason to set aside public concerns on grounds that people are misinformed fails to take into account how the complex relationships among ethical values, scientific knowledge, emotional responses, historical memories, or institutional responses play a role in people’s attitudes toward biotechnological innovations.

Finally, using appeals to disgust as a mark of irrationality on the grounds that such appeals fail to focus on evaluating risks and benefits incorrectly presupposes that science and technology are value neutral.<sup>87</sup> In this view, science is objective, rational, and free from the influence of nonepistemic values, and technology is a collection of machines, techniques, and tools. Thus allegedly neither science nor technology is influenced by moral, social, or

political values. Because each is understood as merely one of the value-neutral tools we have for understanding and manipulating the world, values enter in only when discussing their uses and implications. This view then presupposes a sharp distinction between scientific and technological knowledge on the one hand and the ethical and social issues that this knowledge and its practical applications may raise on the other. It thus allows for an ethical analysis of science and technology, but only one that is limited to evaluating their risks and possible benefits.

But if, as many have argued, science and technology are indeed value laden,<sup>88,89,90,91,92</sup> to presuppose that the only rational concerns are those that relate to their impact is shortsighted. Such evaluation will leave out of the picture other legitimate ethical concerns, such as ethical questions about the scientists and engineers’ work, their assumptions, the values underlying their projects, the utility of such programs, the goals that are pursued, the value of such goals, how the practices and values of knowledge production influence the types of technologies that are developed, how they affect the technologies that are found desirable or even feasible, or the values embodied by new technologies. Also ignored would be discussions about what kind of values are promoted and disregarded by new technological developments, or how the values underlying scientific and technological practices influence choices, preferences, and possibilities. Arguably these questions and concerns are all important when making claims about the ethical permissibility of developing and implementing new biotechnologies. Thus, to use appeals to disgust as prototypes of unsound concerns about technological developments is likely to considerably

impoverish the ethical discussion of the issues at stake.

### Conclusion

The issue of what role disgust should play in bioethical reflection will continue to be a contentious one. This is particularly so in disputes aimed at determining how societies should respond to new scientific and biotechnological innovations and in debates attempting to decide whether as members of those societies we want to and should press forward. Because of the practical implications of these discussions, an adequate grasp of the complex ways in which disgust has been and is still used in the discussion is crucial.

Here we have tried to contribute to this clarification by sketching and assessing four different and interrelated uses of the emotion in the literature. The first illuminates the need to engage in a serious and systematic discussion within bioethics about the emotions, what they are, and what role we can expect them to play. Such a discussion must however take into account the considerable theoretical and empirical work that has been done on these issues. The second shows the extent to which a debate that revolves around the wisdom of disgust cannot omit an examination of the underlying assumptions about this particular emotion and its content. The third and fourth point out how sometimes the desire to incite people to accept a moral position on new biotechnological advances results in either the promotion of moral commitments without giving much thought to what kind of commitments they are or to a dismissal of what might be the legitimate concerns of others.

An evaluation of these different uses highlights aspects that both those who tend to find new biotechnological advances morally problematic and those

who are more sympathetic to them have overlooked. Arguments about what role disgust should play in bioethical debates, whether there is any wisdom in disgust, or whether it should be purged from moral judgments on biotechnological advances need to be clear about what one means or wants to accomplish when appealing to disgust. Otherwise, we are unlikely to move this dialogue forward.

### Notes

1. See, for example, Rozin P, Fallon AE. A perspective on disgust. *Psychological Review* 1987;94:23–41; Kekes J. Disgust and moral taboos. *Philosophy* 1992;67(262):431–46; Miller WI. *The Anatomy of Disgust*. Cambridge: Harvard University Press; 1997; Kahan D. The progressive appropriation of disgust. In: Bandes S, ed. *The Passions of Law*. New York and London: New York University Press; 1999:63–79; Rozin P, Haidt J, McCauley CR. Disgust. In: Lewis M, Haviland J, eds. *Handbook of Emotions*. 3rd ed. New York: Guilford; 2008:757–76; Nussbaum M. *Hiding from Humanity: Disgust, Shame, and the Law*. Princeton, NJ: Princeton University Press; 2004; Deigh J. The politics of disgust and shame. *Journal of Ethics* 2006;10:383–418; and Nussbaum M. *From Disgust to Humanity: Sexual Orientation and Constitutional Law*. New York: Oxford University Press; 2010.
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  41. For someone who disagrees with the link between disgust and food rejection but who still believes that tutored disgust can play an intelligible role in explaining our moral judgments, see note 1, Deigh 2006.

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