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Public Trust in Technology – A Moral Obligation?

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Abstract: Biotechnology proponents claim that the public has a duty to trust biotechnology due to its potential for handling significant future food security challenges. This article uses Kant's moral and political philosophy as basis for constructing a framework for analyzing trust as a moral duty, both in personal relationships and in institutional settings. This includes trust in technology that is of societal significance. A discussion of key concepts of trust leads to an argument that there is a conditional duty of reflexive trust in fundamental social institutions, including technology. However, reflexive trust in, for example, food biotechnology cannot be conceived of as an individual task. A duty of reflexive trust in technology can only be achieved within a publicly controlled institution of trust-building systematic distrust. This system should ideally clarify which instances and to what extent a technology is ethically justifiable and of benefit to society in general.

Keywords: Kantian ethics; reflexive trust; distrust; food biotechnology

1 Introduction

Public distrust in institutions such as food biotechnology has been a topic for discussion and research in many years. Quite a few technology proponents mean that this distrust is misplaced and based on inadequate knowledge, media simplifications, and willful misinformation from lobby groups with vested interests. Many think that the public should trust the technology. One way to understand this, is that there is a *duty* to trust the technology. In the philosophical trust literature, however, there has been little concern with the obligation to trust. The main themes have been the conditions for placing trust wisely or when it is rational to trust, or the moral duty to be trustworthy. In addition, most of the philosophy literature has been concerned with interpersonal trust, leaving the issues of institutional trust to social scientists, although there has been a growing philosophy interest for this topic in the last

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decade. In the following, I will draw on Kant's moral and political philosophy to discuss whether, and if so, under which conditions, we have a duty to trust non-formal institutions such as biotechnology in food production. Kant has not said much about trust and less about trust in institutions. I will follow Onora O'Neill in regarding trust as a fundamental, mainly implicit, aspect of his moral theory and add that it is equally important in his political philosophy. I will analyze key concepts, such as basic social trust (distinguishing between negative and positive), blind trust, lazy trust, prudential trust, moral trust, and reflexive trust. This is followed by discussions of what is meant by trust in technology and public trust. I will argue that, according to Kant's moral and political philosophy, we have both prudential reasons and a moral duty to place reflexive trust in technology, on condition that there exists a public control system ensuring that the technology is safe with a fair distribution of benefits.

2 Vulnerability, Risk, and Basic Social Trust

Traditionally, standard accounts have assumed that trust is a three-place relation: A trusts B with some valuable thing, where "thing" is widely understood. On these accounts, trust is seen as a chosen act with a particular purpose. It is common to understand trust as leaving oneself vulnerable in the sense that one takes a risk when trusting someone. This risk can be more or less rational depending on how well-founded my trust is in relevant knowledge about the trustee. The most elaborate version of this tradition is Hardin's concept of encapsulated interest: A trusts B because A believes it is in B's interest to further A's interests (Hardin 2006). As Lagerspetz has convincingly argued, this makes trust redundant since "cooperation can be expected anyway for other reasons" (Lagerspetz 2015, 39). If A knows that B's best interests is acting in accordance with A's interest, A knows B will do as wanted and trust is not needed. To give an example: When I am alone on a populated beach and want to take a swim, I have to leave my valuables on shore. If I trust the other beach guests to leave my belongings untouched, I take no risk. But I will feel let down if I get robbed. If I believe there may be some dishonest people on the beach, going for a swim would mean taking a risk, but that is because I do have some distrust. If I discover someone has taken my wallet, I will not feel let down – I knew there was a risk. I will be angry, and I may blame my own lack of caution. If I distrust, I take a risk when I let down my guard. Trusting is not taking risk but acting within an acknowledged or assumed moral relationship.

It is still meaningful to say that trust "is to lower one's guard" (Elster 2007, 344). But when I lower my guard, it is usually because I feel safe and that is what I do when I trust someone. Saying that I leave myself vulnerable is the correct description from

a third-person perspective. From this point of view, one may even call it to be *exposed* to risk. Still, I do not *take a risk* in this situation; that is something I do when I think something may go wrong and, hence, make myself vulnerable. From a first-person perspective, however, to trust is to perceive myself as less vulnerable than if I were alone. What would have been my responsibility alone is now something I share with others (Lagerspetz 2015). If I feel vulnerable, I am not fully trusting the other person. I may behave as if I trust – that is lower my guard – in order to strengthen a relationship, to learn a child responsibility or because I have no choice. Then I am not trusting but hoping. In case of failure, it would be irrational to feel let down or betrayed, but reasonable to feel disappointed.

This three-place relationship description seems to rest on some more fundamental form of trust: to trust others to act in a certain way, we usually must trust them in a broader sense. This indicates that the two-place relationship A trusts B is a condition for the standard three-place relationship (Domenicucci and Holton 2017; Faulkner 2017). I trust you and that is why I trust you to borrow my car. That I trust you does not mean that I trust you with everything or unconditionally. Your competence will be a restriction, so even if I trust you, I may not trust you to navigate safely in dense fog at sea. Another restriction is how well I know you and how close we are. If I do not know you well, I may lend you my car, but I will not let you take care of my child while I am away over the weekend. I do not distrust you in the sense that I hold you to be untrustworthy, I just do not know you well enough. This indicates that ‘distrust’ may have different meanings. I *can* say that I distrust someone whom I just do not trust. However, usually I would mean something stronger: There is something about this person that warrants active distrust. Perhaps, we should say that trust and distrust are the endpoints on a gradient scale rather than a binary concept pair? I trust people to a certain degree or with some interactions but not others, and I can decide not to trust someone without judging them untrustworthy.

Basic or generalized social trust (Delhey and Newton 2005) is a two-place relationship trust. This is a background trust usually taken for granted, required for us to function in everyday life, and a key to a well-functioning society. Sociological studies on degrees of social trust in different societies point to its political, social, and psychological significance. Basic social trust has been repeatedly shown to be particularly high in societies that score high on welfare and happiness, such as the Nordic countries (Ibid.). It has two aspects, illustrated by this situation: When I lie on the beach in my hometown, I am not watchful or anxious about being attacked or harassed. We can call it *negative* social trust – I expect others neither to harm me nor to prevent me from doing what I wish unless they have due cause. In addition, if I get trouble when in the water I expect – or even know – that others will come to my rescue or alert someone who can. This can be called *positive* social trust – I expect

others to assist me when in need. In parallel with the distinctions between positive and negative rights and duties (Malm 1991), negative trust is usually clearly delimited and failure to live up to it is followed by stronger negative reactions than positive basic trust, which is usually more a reason for gratitude. Usually, positive trust is what is discussed in the philosophy literature, but for the demand for public trust in technology, both are relevant.

3 Blind, Lazy, and Reflexive Trust

Trust is not always a matter of choice. An infant *must* trust and has no basis for deciding to trust; blind trust is the only option. This is typical of some kinds of asymmetric trust, such as the parent–child relation. On Kant’s account, parents have a duty of care and “to make the child content with his condition so far as they can” (Kant 1797, 6: 280). But this duty also includes a right to “*manage* and develop the child” (Ibid. 6:281), making this notion of care clearly paternalistic compared to contemporary conceptions of care. Although the child is a person, the parental right is analogous to the right to a thing (Ibid. 6:282). This may demonstrate Annette Baier’s critique of the “male fixation on contract” in traditional philosophy, in this case explained by Kant being a “puritan bachelor” (Baier 1986: 274–248) with presumably limited relevant experience. His idea of the perfect human fulfillment of the natural drive for social contact is made in equal friendships where potential imbalances are regarded a significant problem.

However, what we can learn from Kant’s account of the asymmetrical family relationships is that blind trust has a proper place and establishes moral duties. This is relevant when adults are in situations where blind trust is not a matter of choice but of necessity. In addition, even most adult relationships are asymmetrical in some respects. Often what appears as symmetrical friendships are reciprocal asymmetrical relations. These imbalances should be regarded as a part of the richness of social life and the basis for other-regarding moral duties. It is the vulnerability of humans that calls for trustworthy behavior, and all humans are at the trusting end at times; most are trusted at other occasions. Even if Kant regarded the perfect friendship as symmetrical, as I return to below, asymmetry is a standard fact of most human interactions. This is certainly the case in institutional trust.

People often have no choice but to trust some expert, institution, or technology. In modern societies, this is regularly the case for almost any task they engage in, from drinking tap water to using a mobile phone. In this context, blind trust does not have the same intrinsic value as in close relationships. It is sometimes a necessity, other times a prudential choice. The question whether it also can be a moral requirement will be dealt with below. Regardless of that, in some situations, an adult choosing to

blindly trust an authority or institution amounts to what we can call, following an interpretation of Kant, lazy trust (Pedersen 2012).

Kant writes that “It is so comfortable to be a minor! If I have a book that understands for me, a spiritual adviser who has a conscience for me, a doctor who decides on a regimen for me, and so forth, I need not trouble myself at all.” (Kant 1784, 8: 35). Blindly trusting expertise in this way means evading a responsibility we ought to take, and Kant calls this “laziness and cowardice” (Ibid.). He is tempering the critique by saying that the experts – “guardians” – promote the laziness and tries to prevent people taking responsibility. There is interplay between authorities and people promoting and reinforcing lazy trust. Besides, as stated above, blind trust is not necessarily lazy – sometimes it is morally right. This passive trust is lazy only when the trustor is a competent adult, and the appropriate behavior is active, reflexive trust. That is particularly relevant for trust in institutions such as technology.

Reflexive trust is a form of trust that balances between naïve faith in others and the cognitive approach to trust advocated by Hardin and others. It could be called justified trust. For it to be trust, there must be something at stake that warrants calling it trust rather than calculated risk. Unlike lazy trust, the trustor takes responsibility for relying on the trustee. But what can be the basis for this responsibility? There must exist some established relationship or at least some previous experience with this person or institution that makes it reasonable to rely on them. Belonging to the same community with shared values is a typical case, but then ‘community’ should not be taken in a narrow sense, restricting it to the shared culture and political traditions typical of, among others, the Nordic countries. I may find it reasonable to trust someone I have not met before who comes from a different cultural background due to the situation we are in together. I may take clues from the way they behave and how we communicate and interact. Of course, I may be betrayed and let down, but that is the essence of trusting someone. Reflexive trust means that after I am let down, I do not conclude that I should *not* have trusted them, including that I failed to take reasonable precaution. This is only an appropriate response if I have exercised lazy trust, failing to reflect whether trust is well-placed.

4 Prudential and Moral Trust

If my trust has been reflexive, I am warranted in calling it well-placed, even if I am let down. Only in this situation can I rightfully be angry at the one who betrayed my trust. Onora O’Neill states that “placing trust well matters because trustworthiness is a more fundamental concern” (O’Neill 2020, 19). This requires, according to her, intelligent judgment of other’s trustworthiness, involving determinant, reflexive, and practical judgment. The first two establishes the competence and honesty of the

other, whereas the latter is crucial when “evidence is incomplete, thereby shaping the world in some small part” (Ibid.). Rephrasing O’Neill, I would say that the two first forms of judgments are in many cases not judgments of trustworthiness but needed for deciding the reliability and competence of some person or institution. Baier argues that O’Neill confuses reliance and trust in her earlier works on the issue (Baier 2013), and one could argue this is also the case for this later article. When I rely on someone because I have evidence that they will act in accordance with my needs regardless of my interests, it is not trust, properly speaking. But when my reliance is based on their perceived honesty and the act explicitly or implicitly takes my needs or wishes into account, it is a form of reflexive trust. The more interesting cases in O’Neill’s classifications, however, concern cases of incomplete evidence, where one must resort to practical judgment. She points out that one may fail by either placing trust in someone untrustworthy or distrusting someone trustworthy, both mistakes being harmful. Looking at Kant’s analysis of friendship, O’Neill’s account is one of prudential, not moral trust.

Kant’s classification of types of friendship can be compared with Aristotle’s distinction between friendships of utility, of pleasure, and of good character (Aristotle 1985). The two first may well be three-aspect trust relationships in that the friendship is connected and restricted to particular purposes. The character friendship, however, is a general relation of trust where the relationship is primary, and the third aspect follows from this relationship. Kant, however, states that utility cannot be the basis for friendship because then one would lose each other’s respect (Kant 1797, 6: 470) due to this being a prudential union instrumentally motivated. Therefore, the only true friendship “is the union of two persons through equal mutual love and respect” (Ibid. 6:469). In reality, this ideal is hard to realize, Kant writes, because it is difficult to ascertain the necessary equality, making it challenging to strike the right balance between love and respect. Thus, friendship can feel as a heavy burden, indicating its character of being a matter of duty, not utility. Furthermore, since we are not perfect moral beings, our trust risks being betrayed.

Kant’s description of the moral friendship is a description of trust between equals. This is a two-aspect trust relation because friendship and trust are general and unrestricted in scope. Friendship has prudential value because man is “meant for society” and has a “need to *reveal* himself to others” (Ibid. 6:471), but it also has moral value because adopting the ideal of moral friendship “makes them deserving of happiness”, giving a moral “duty of friendship” (Ibid. 6:469). However, rather than regarding friendship as an arena for *equal* “mutual love and respect” in a symmetrical fashion, it may be more precise to think of it as a two-way asymmetric but complementary mutual love and respect. It seems contrary to the unconditional character of morality to make equality and balance in contribution a requirement. In

this ideal moral relationship, trust must be unconditional. Part of these moral relationships must be a duty to trust.

However, Kant states that we ought not to trust friends fully. Human nature is basically untrustworthy because of a tendency to fool both others and ourselves due to an ambition for social recognition, causing “secret falsity even in the most intimate friendships, so that a restraint on trust in the mutual confidence of even the best friends is reckoned a universal maxim of prudence in social dealings” (Kant 1793, 6: 33). There are prudential reasons for restricting trust even in close friendships, but as important should be the moral reasons for caution. Even if I have a duty to promote the happiness of others, this is restricted by the demands of morality and my own considerations of what would make others happy (Kant 1797, 6: 388). I should ensure that my trust in others does not contribute to their doing evil. I should also ensure that my trust in others does not prevent me from acting morally good or lead me to do evil. This latter is perhaps the most important form of moral distrust, as I will return to later.

Considering the way Kant stresses caution against trust in friendship, it is strange that we have a moral duty to cultivate trust-based friendship. One way of seeing this is that our duties to cultivate friendship concern pure, ideal conditions; we should act as lawgiving members of a kingdom of ends, where everybody is governed by the moral law. This must be qualified as long as we live under these non-ideal conditions. However, Kant also claims that there can be true moral friendship even under these imperfect conditions of civilized society:

[T]he closest friendship requires that a judicious and trusted friend be also bound not to share the secrets entrusted to him with anyone else, no matter how reliable he thinks him, without explicit permission to do so. This (merely moral friendship) is not only an ideal but (like black swans) actually exists here and there in its perfection. (Ibid. 6: 472)

Friendship is not a virtue, but an arena for the exercise of virtues. Kant finds the basis for these virtues in our natural sociality, which is included in the predispositions to good in human nature. Animality comprises the purely physical drives toward self-preservation, reproduction, and community with others. In this sense we are what Aristotle calls social animals. But our rationality makes us more than animals – as is expressed in the predisposition for humanity, which is mainly expressed in a tendency to compare ourselves with others and hence a drive for social recognition. In addition, we have a predisposition for personality, which is the moral feeling, enabling respect for the moral law. This makes it possible for us to develop a good character. Interestingly, all three of them are predispositions for the good and together provide basis for the development of virtue. There are two lessons here for constructing a Kantian theory of trust: First, we are by nature good beings, although highly corruptible. Hand in hand with the human predispositions for the good goes the propensity for evil, although we are not Hobbesian egoists. Second, sociality is an

essential part of our natural predispositions for the good, both in the pre-rational animality and in the rational humanity. This means that we have a moral duty to trust our fellow humans, be they friends, acquaintances, or strangers, but not unconditionally. In addition, here we have a duty to be reflexive when placing trust in others.

This seems to stand in contradiction to the initial description in this paper of trust as lowering the guard and feeling safe, exactly the kind of unconditionality denied by the demand of reflexivity. To explain how these two accounts go together, one could think of this as a matter of temporality. Reflexivity is a requirement for placing trust on Kant's account. Once we have established that there is a sound moral basis for trust, however, we can and should let go. Continuing to question or controlling the trustee after deciding that trust is morally warranted would mean not to trust. To reuse the example of leaving my valuables while going for a swim: My familiarity with my local community makes this a matter of reflexive trust in my hometown. My trust is part of an established culture of trust. If I act the same trusting way in a foreign place where I know nothing about the local practices, I exercise blind trust. But if I engage with local people and find that this is also a trusting community where people take care of each other, the morally right thing would be to lower the guard here, as well.

This means there are at least four forms of trust exercised by competent adults. The first is lazy trust, where we just trust an authority without deciding whether this trust is warranted. The second is in situations where there is no choice but to trust blindly without sufficient knowledge or information, for example, when I am running empty of petrol and there is just one petrol station. The third is when I deliberately choose to trust for prudential reasons. A typical case is consenting to user conditions of a new phone app without reading them. We usually have experience with similar instances that did go well, and we know "everybody else" places trust similarly, making it a justified bet. The borderline between lazy and prudential trust is blurred. The final kind of trust is moral trust where the reliance is because it is the right thing to do, morally speaking. In close relationships, trust has intrinsic value, as well as having instrumental value for both parties. Arguably, in close relationships we have an *obligation* to trust unconditionally. But do we have a duty to trust technologies or other institutions? Or is it even reasonable to claim that technology is a kind of entity that can be trusted?

5 Can a Technology be Trusted?

One may very well ask whether "trust" is the correct term to use in discussing how to relate to technology. There is a well-established distinction between trust and mere reliance, where trust is something we can have in people who can let us down,

whereas we rely on natural phenomena and machines to work as we expect. This is captured by Baier (1986) in that we feel betrayed or let down when the trustor fails but we are merely disappointed when a something we rely on fails. Holton (1994) says, in reference to Strawson (1962), that to trust is to take a participant stance, where reactive attitudes as resentment or gratitude are appropriate responses, connected to the ability to take responsibility. A machine or a technology in the narrow sense cannot take responsibility. When we say that the public distrusts food biotechnology, we apparently mean that they are unwilling to rely on the technology. However, ‘technology’ can have different meanings, and at least one of them makes talking about trust appropriate.

Technology is defined as “the application of scientific knowledge to the practical aims of human life” (Encyclopedia Britannica 2023). This already points to the human factor, both in generating knowledge and in applying it. But this is further enhanced if we accept the understanding of technology as a socio-technical system where technology narrowly understood “embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions” (Jasanoff 2004, 3). Technology is not merely machines, hardware, and software, or different processes, but includes social practices in which the concrete products are made possible and social practices that are based in the products. As has been convincingly argued by Hardwig (1991), the establishment of scientific knowledge requires trust and that cannot be merely prudential trust. This epistemic trust that is required for the establishment of scientific knowledge is a form of moral trust. Lay people, who are on the outside of this trust-based expert community, can trust or distrust technology in a moral sense when it is understood as a social institution, as described by Jasanoff. But this non-expert trust in the institution is not pure epistemic trust of the kind exercised within the scientific community, since the outsider trust is action oriented. Regardless of that, the social embeddedness makes it reasonable, under certain conditions, to take a participant stance toward technologies and feel betrayed or let down rather than merely disappointed if it does not work as promised. Perhaps our resentment is directed at the scientists or governmental regulators, but then they are taken to represent the relevant socio-technical system.

Even if we accept that technology is a partly social system, it is also a collective entity, which is not “fully-fledged persons in every respect” (Hawley 2017, 231). This leads Hawley to argue that the trust-reliance distinction should be abandoned for such entities. Hawley’s claim is that we do not have *moral* expectations to collective entities as we have to people that we trust, and when collective entities fail, we do not feel betrayed but disappointed like we do when the dishwasher stops working. Our reliance on them does not need the moral component. Although Hawley’s account may be reasonable in some cases, it is not adequate for all collective entities in all circumstances. Since my point of departure is the claim that there may be a duty to

trust technology under some circumstances, I will assume that we take a participant stance toward some such institutions.

It is usual for social science researchers, journalists, and others to survey people's trust in different societal institutions, broadly conceived. This may include parliament, government, political parties, police, health and social services, banks, universities, NGOs, and media. The question may be about generalized, non-formal institutions as above or about concrete institutions such as a particular bank, newspaper, or hospital. Surveys seldom tell exactly how people understand a question, and it may be that some respondents answer how reliable they perceive the institutions to be rather than whether they trust them. The conclusion should not be that 'trust' in institutions is reducible to reliance. If we hold on to the understanding of trust as a moral relation involving a participant stance, I will claim that we do have a reason to talk about trust in technology. This is exemplified in the public reluctance to accept the use of biotechnology in food production, which clearly has a moral element. Likewise, spokespersons of this technology hold it to be a moral duty to trust the technology, since it is a major factor in solving the problem of food security for a growing world population facing a changing climate (Borlaug 2000). But is this right? It is reasonable to say that there is a moral duty for the technologists to be trustworthy, but can there be more than prudential reasons for trusting institutions?

That we may trust institutions, we know from the political arena. When politicians in well-functioning states are caught in lies, the reaction is moral condemnation, rather than mere disappointment. This is not merely because the citizens trust this particular politician, but because they are one instance of the institution. In other countries, however, the trust in politicians is minimal, and we may assume that most people are not *morally* upset when lies or corruption are disclosed. But they are not disappointed either. They neither trust nor rely on the politicians to be honest and upright. Likewise, when minorities are treated badly by the police, they are not disappointed because they neither trust nor rely on the police to treat them fairly. But they may be morally outraged at the lack of justice in an institution that should have treated them fairly but does not. This indicates that politicians and police are groups that are regarded as appropriate trustees, even when they fail to be trustworthy.

But who do I trust when facing a multifaceted institution such as science, research, or technology as we see in the case of biotechnology to develop new food products (Meijboom 2020)? There are many actors involved in biotechnology development, and people report different levels of trust in different actors. Thus, the trust in university researchers is greater than in regulatory authorities and commercial industries (e.g., Gaskell et al. 2010). It is not easy to say how that difference in trust plays out for trust in biotechnology as an institution. First, the relation between

the different actors is complex and it is difficult for people to know how they interrelate. If I trust the university researchers that invent new and useful products, but know that they need the biotech industry, which I distrust, to develop these products, how do I trust the combined results of their collaboration? Now, given that I trust regulatory authorities, I may think that they ensure that the product is safe and beneficial to use. But even if I have a general trust in the regulatory authorities, I may suspect that they are influenced in their decisions by the industry in a way that undermines my general trust. I may conclude that even if they are generally trustworthy, having the best intentions, they may have inadequate competence in this field or they may be too trusting regarding the information they receive from the industry. So even if I am inclined to trust key groups of actors, my distrust of one actor may lead to distrust in the institution as such. If I am treating this as a matter of prudentially placing trust well, this concluding distrust is unproblematic. It is, as is regularly stated in the literature, a problem that must be resolved by the trustee being trustworthy and able to signal their trustworthiness. But if we have a moral obligation to trust institutions, like I have argued we have toward other people, we need to know on which grounds we have this obligation and under which conditions.

Trust in institutions is an asymmetric relation (Meijboom 2020). I may trust or distrust the institution, but there is no meaning in the institution trusting me. In this respect, it is like the parent–child relationship. For this reason, we cannot use Kant's analysis of trust in friendship without adjustment. Still, the distinction between prudential and moral trust drawn from this account is relevant, given that there is basis for claiming that we may have an obligation to trust the institution, not only prudential reasons to place trust well. In order to get closer to the basis for such an obligation, we must discuss the concept of public trust, which is often regarded as crucial for a well-functioning society.

6 Can a Public Trust?

There are numerous studies of public trust in different institutions, and it has taken on the character of being a buzzword covering a wide range of phenomena (Hunt and Frewer 2001; Resnik 2011). Biotechnology is a typical example, since trust has been a central issue, not least because of the significant public *distrust*, especially in Europe (Gaskell et al. 2010; Hunt and Frewer 2001). Already here there are several conceptual questions to raise. Is there such a thing as *public* trust or distrust, and what does it mean that a group of people trusts products or institutions? One way of putting it, is saying that “public trust in research is multifaceted because different members of society have different expectations of research” (Resnik 2011, 405). This makes it reasonable to distinguish between different relationships for analyzing

public trust: individual, semi-social, and social (Contessa 2023). The way the concept is used in political and academic discourse, “public distrust” means that a significant number of the population within a state or other political unit says that they do not trust. This is usually expressed in polls or surveys where the opinions are connected to conditions and reasons. In a technology context, these conditions and reasons are usually based on risk perception or ethical concerns, widely conceived. Public distrust is not only a matter of more or less justified opinions expressed in polls and surveys. It is also reflected in how the issue is treated in public debate and mass media. When there is general trust in an institution or range of products, the issue is not offered much notice in public communications. It does not seem necessary that a majority expresses such distrust for calling it public distrust. It is sufficient with a significant minority.

Why is it called public distrust even in cases where the majority expresses trust? It would be reasonable to say that as long as more than 50 % trust the institution, we are in a condition of public trust. In some cases, the reason is that distrust among a significant minority is reducing or preventing required effect from science-based policies. One example is vaccines where ‘herd immunity’ is protecting everybody, even those who cannot have a vaccine for health reasons. The numbers needed for achieving such immunity varies with diseases, from 95 % for measles to 80 % for polio (WHO 2020). In case of a pandemic such as COVID-19, where the immunization and herd protection effects were less significant, large numbers of vaccine refusers would lead to an overburdened health service and more casualties. Another case is the widespread distrust of climate research, making it difficult to implement efficient policies such as reducing air travel or red meat consumption. Even if the majority trusts science as an institution, efficient policies in many cases need more than majority support. Thus, even if most of the public trust food biotechnology as an institution and the minority that does distrust still trust most of the actors in the field but not all, we may have a situation of public distrust.

7 A Conditional Duty to Trust Technology

I have argued that there is a moral duty to trust other humans, but this is a duty with conditions. We must always exercise reflexive trust to avoid becoming victims of other’s deceit or becoming tools of evil. This does not mean that we should distrust others, but rather take responsibility for whom to trust under which conditions. Trust means treating others as autonomous moral agents, meaning that distrust is what needs justifications, not trust.

I have also discussed and concluded that it is meaningful to talk about trust in non-formalized institutions, for example, biotechnology, as long as we are aware that

“trust in biotechnology can only refer to trust in human agents involved in biotechnology, but not the technology itself” (Meijboom 2020, 382). There are still problems with how to place the trust due to the multifaceted character of institutions of this kind. There are different agents whose interests and intentions cannot be aligned and known. But technology is not different from other institutions claiming authority in this respect. This is why Kant insists on our moral duty to think for ourselves and never fall back into lazy trust when interacting with different kinds of social authorities. It is important to notice that Kant included unspecified expertise in the form of “a book that understands for me” (Kant 1784, 8: 35) among the authorities whom I should trust reflexively. Thus, it is reasonable to hold that his analysis of trust is relevant also for technology understood as socio-technical systems.

It is easy to see that there can be prudential reasons for trusting technology. We live in societies dominated by technologies, and as social scientists have pointed out, trust is a strategy for dealing with the complexities of these societies (Luhmann 1968). But this does not make it a moral duty to trust these systems. As we saw, biotechnologists think there is a duty to trust this technology because it provides a needed solution to problems facing all of humanity, but this requires that we in the first place trust these biotechnologists and believe their assertion is true: we need biotechnology to feed the world. Even if it is the case that we have a duty to trust the technology if the technologists are right about their claim, this gives us no duty to trust them and their claims in the first place.

In order to see why we have this duty, we must take a step back, and discuss whether we have a duty to trust *any* institution according to this Kantian framework. In his political philosophy, Kant states that every human being have an inherent right to freedom, and our primary political duty is to enter a law-governed state because that is the condition for ensuring human freedom (Kant 1797, 6: 237). This means that we have a strong moral duty not only to be part of such a state, but to uphold it. One consequence seems to be that one has a duty of participation, of citizenship. The societal institutions should actively be supported and upheld by the citizens. This is clearly expressed in Kant’s discussion of the demand to think for oneself as the fundamental requirement of enlightenment. One should obey the authorities but use the freedom of the pen to criticize. Enlightenment is not possible to achieve alone, and it is a collective endeavor. Critique is required for improving the institution for “further progress in enlightenment” (Kant 1784, 8: 39).

The state consists of a number of institutions necessary for its function, so if we have a duty to uphold the state, we also have a duty to uphold its constitutive institutions. One cannot uphold an institution without participating in it, and that means trusting it. Thus, we have a duty to trust institutions that are part of the societal structure. This is not uncritical, lazy trust. The trust requirement implies the obligation to think for oneself and criticize the institutions for bad practices and

misguided doctrines. This kind of reflexive trust has limits, and we have no duty to trust a dogmatic institution that prevents critique and by that the possibilities of progress. Still, the basic idea is that, just like we have a duty to wisely trust friends as well as other fellow humans as a way to respect their autonomy, we have an obligation to reflexively trust the basic institutions of a law-governed state. Without these institutions, there can be no organized state ensuring human freedom.

Not every institution is a necessary element of a well-functioning state. Why should technology, and particular technologies as biotechnology, be a trust-requiring institution? The short answer is that modern society is a technological society in the sense that technology is the fundamental infrastructure of this society, and it will not function without trust in fundamental technologies. This may sound like a pragmatic argument like the one presented by Luhmann (1968) where trust is a way to deal with complexity or by Fukuyama (1995) where trust is regarded as the lubricant of a well-functioning societal machine. The point is related, but slightly different. Usually, it is prudential for us to trust these institutions, but we also have a morally based obligation of trusting some such institutions. Because technology is making the modern law-ordered state function as such, we cannot uphold this state without trusting the technology. However, this must be a reflexive trust, one where we critically examine the technology while using it. This means that we have a moral duty to trust technologies that are essential to the functioning of the state, but also that we have a duty to place this trust well. Not every use or every aspect of the technology must be accepted. Quite the contrary, the technology must serve a positive role in the progress of society in general, rather than particular subsets of it. We have no duty or prudential interest in promoting technologies that may be beneficial for some groups in society at the cost of other groups. This is part of being a trustworthy technology in this setting: that it is a technology that aims for the common good. There needs to be a structure of criticism in place for ensuring this trustworthiness. Without such criticism, there is no duty to trust the technology. In this, trust is like a well-functioning friendship, where room for mutual criticism is a necessary component of establishing and upholding the reciprocal confidence.

When I trust a technology, I usually assume that it will not be harmful for me to use it. Therefore, my trust in technology is in most cases negative trust. However, when we ask whether we have a duty to trust a technology because it serves a societal good, the issue is one of positive trust. Do I trust that the technology will promote some moral good, such as the future prosperity of humankind? This is a much stronger requirement than merely trusting that the technology will not cause harm. In the debate on controversial technologies such as food biotechnology, both kinds are in play, but they are rarely distinguished.

8 A Duty to Trust Biotechnology?

Food biotechnology has been highly controversial in parts of the world since its introduction, something that can be explained in numerous ways, such as public lack of knowledge, activist propaganda, economic power shift through patenting, poor communication strategies, and several others. It is commonly assumed that what is required is negative trust that the products based in this technology will not be harmful to humans or the environment. Therefore, the matter is usually posed as one of risk management. If we can ensure that the technology is safe, then people ought to trust it.

If this is the whole story, then what is needed is a trustworthy control system of the technology, what Luhmann (1968) describes as trust through institutionalized systematic distrust. This is an institutionalized system for checking that a particular instance of a technology functions properly by an organized search for flaws or malfunctions. As mentioned above, when Kant states that we have a duty to refrain from lazy trust in authorities, he also admits that this is difficult to achieve for individuals alone. They must overcome expert paternalism as well as own complacency (Kant 1784), and this is only possible through a collective effort. Publicly controlled systematized distrust, as described by Luhmann, is one way to realize this emancipation from the well-meaning paternalism of different kinds of experts. When I know there is systematized distrust in place, which I have access to if I wish further information, my trust is reflexive rather than lazy in the Kantian sense (Myskja and Steinsbekk 2020). I do not trust the technology because some expert tells me to. I know that there are other experts systematically distrusting these experts, and I trust them – not because I know them personally or because I have experience with their work, but because I rely on the attitude expressed in this systematic search. They make a promise to the users that the technology will be safe and work in accordance with the description. When I trust a technology, I do so because I trust that an independent, competent expert has tested it systematically based on an assumption that it is not trustworthy. But this is merely a negative trust. The biotechnology risk assessment procedures, for example, those of the European Food Safety Authority, are of this kind. But since the distrust is not only, perhaps not even primarily, concerned with health and environmental risks, the control systems may not address what are the main reasons for reasonable distrust.

If the main worry of the public distrusting biotechnology, as is suggested in the literature (Fisher, Wennström, and Ågren 2019; Gofton 1996; Myskja and Myhr 2020; Tait 2001), is how it affects food related value systems or issues of ownership to food production, then the risk assessment system is inadequate as a way to address those concerns. This assessment does not address the positive outcome promised by the

technology proponents. Even if there is basis for negative social trust in the technology, there are no safeguards justifying reflexive positive social trust. What is needed is an institutionalized control that the technology has broad societal benefit and promotes rather than undermines the values implicit in the traditions surrounding food production and use. This “non-safety assessment” (Zetterberg and Björnberg 2017) would not be very expensive and time-consuming, and the long-time experience with safe use of gene modification may warrant a simplification and more targeted risk assessment regime. From a trust-promoting perspective, it is equally significant having non-safety assessments, if we assume that the main problem of trust concerns the positive promises of a fair distribution of social benefits of the technology, not merely the negative promise of safety.

9 Conclusions

Many biotechnology proponents argue that we have a duty to trust this technology because it is required for solving the future problems of mankind. Usually, the literature on trust is not much concerned with a moral duty to trust, and the literature on trust in institutions is concerned with placing trust well for prudential reasons. I have argued that Kant’s moral and political philosophy provides a basis for constructing a framework for analyzing trust as a moral duty, both in personal relationships and in institutional settings. This includes trust in technology that is of societal significance. However, such reflexive trust in technologies such as biotechnology cannot be conceived of as an individual task. Just as the moral duty to reach enlightenment cannot be achieved by one person alone, but may be achievable as a collective endeavor, according to Kant, so can a duty of reflexive trust in technology only be achieved within a publicly controlled institution of trust-building systematic distrust. This system should ideally clarify which instances and to what extent a technology is ethically justifiable and of benefit to society in general. A control system of this kind will help the individual and the general public orient themselves regarding when there is a moral duty of trust.

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