UNDECIDING THE DECIDABLE

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ABSTRACT

Heinz von Foerster's influential distinction between decidable and undecidable decisions may be taken to imply an ethics that is personal and pluralistic, summed up in invocations to decide the undecidable and to act in ways that increase the number of choices. While this approach is helpful as a critique of moralism and objectivity, it is of limited assistance in situations characterised by conflict, inequality, or the need for collective action. In this paper, I return to Foerster's discussion to suggest a different way of thinking about ethics in terms of undecidability. I argue that it is not enough to decide upon (take responsibility for) undecidable questions. To confront the injustices that are embedded in the present world, decidable decisions—those that Foerster characterised as decided already by the frameworks in which they are asked—also need to be challenged.

Whereas Foerster traces undecidability back to foundational metaphysical questions, positioning the ethical within the context of a choice between distinct worldviews, I situate decidability and undecidability as frames to move between within the context of practical situations. To complement the need to decide the undecidable, I explore the value of undeciding the decidable. By undeciding, what I mean to suggest is a process of reconceiving the framework in which a decidable decision is asked such that the framework is itself undecidable, thus requiring a decision to be made as to the decidability of the decision that is at stake. A consequence of putting decidability in question is that it is not sufficient to discharge one's responsibilities as they arise. One must become responsible not just for one's responsibilities but also for what these are and how their boundaries and scope are conceived. From this perspective, I offer an alternate reading of Foerster's call to increase the number of choices, understanding this in the sense of acting to increase the number of decisions that are to be made rather than increasing the number of possibilities to be chosen between.

Keywords: Cybernetics, Ethics, Undecidability, Critical

INTRODUCTION

Heinz von Foerster's 'Ethics and Second-order Cybernetics' is one of the most influential texts concerning ethics from within the discourse of cybernetics. Its criticisms of objectivity and moralism as neglecting responsibility offer potential places to build from in developing the critical potential of cybernetics, although they are not without difficulties or limitations, some of which I discuss here. The paper originated as an address to a conference on family therapy, held in Paris in 1990, and was published as an article in the

first issue of the journal *Cybernetics and Human Knowing* and subsequently elsewhere (Foerster, 1992, 1995, 2003a). Foerster frames an approach to ethics that is personal and pluralistic, encouraging readers to decide undecidable questions and to 'act so as to increase the number of choices' (Foerster, 2003a, p. 295). While Foerster focuses on individual responsibility, my purpose here is to reframe his discussion, transforming it to instead address the contexts in which such responsibilities arise. In doing so, I provide an example of how some of cybernetics' established ideas may be reinvented and repurposed in response to present challenges.

In the decades since Foerster's paper, its ideas have proved easier to quote than to extend. This is in part because, as a transcript of a talk, its principal arguments are carried by Foerster's skilful rhetoric rather than being developed explicitly in writing. There is more than one way to interpret the connections that Foerster establishes, making for a rich and thought-provoking paper, but one that is hard to build on or contest with precision. Moreover, a theme of Foerster's paper is that 'ethics cannot be articulated' (Foerster, 2003a, p. 290)—that ethics needs to remain implicit in action rather than being made explicit in words, as the latter may lead to moralisation. While this idea does not exclude theoretical development, it has not encouraged it.

That it is difficult to develop the ideas of Foerster's paper does not mean that this should not be attempted. After all, there is nothing about ethics that should make us expect it to be easy. Foerster sets out a powerful critique of moralism and objectivity, but one that resonates more directly with the optimistic, liberal individualism of the late C20th than with the challenges the world faces today. It is of limited assistance, for instance, in those contemporary situations that are characterised by social conflict, inequality, or the need for collective action, all of which go beyond the context of the individual.

In the present paper, I focus specifically on the relation between decidable and undecidable decisions that is at the heart of Foerster's discussion. In doing so, I am not necessarily concerned with Foerster's intended meaning. Rather, my approach is to actively use some of the ambiguities in his text to develop new thinking. Whereas Foerster traces undecidability back to foundational questions of worldview, I position the decidable and undecidable as frames that can be moved between within practical situations in everyday and professional contexts. In contrast to Foerster's invitation to decide the undecidable, I explore the value of undeciding the decidable, by which I mean a process of treating the framework in which a decidable decision is asked as if that framework is undecidable. By shifting focus from the undecidable to what we encounter as decidable, I reframe the relevance of undecidability beyond questions of fulfilling individual responsibility, positioning it as a device that may be used to challenge the social, educational, and technical contexts in which responsibilities are formed.

The contexts in which one acts are laden with numerous assumptions and commitments, some of which participants have explicitly given assent to and some of which are implicitly adopted through participation in the situation. These explicit and implicit frameworks go on to limit the possibilities of the present by making particular outcomes appear as if they are inevitable. While such constraints have many positive qualities in what they enable and sustain, they may also be a source of persistent injustices and recurring crises, and it can

seem that such factors are unalterable. For different social realities to become possible, contexts of action that appear to be fixed must be re-opened to negotiation.

I begin by summarising Foerster's framing of undecidability, clarifying its meaning and relevance as I see it. I go on to explore ways in which this may be related to ethical discourse, including Foerster's discussion of foundational questions. I give a selection of illustrative examples of what I intend by the undeciding of the decidable and conclude by offering an alternate interpretation of Foerster's call to increase the number of choices, re-reading it as acting to increase the number of decisions that are to be made rather than increasing the number of possibilities to be chosen between.

UNDECIDABILITY

Amongst the many issues that Foerster's paper touches on, it is the discussion of undecidability that is central. Drawing on, but not dwelling with, the formal sense of undecidability in the work of Gödel (2004), Foerster frames decidability and undecidability in the broad sense of whether questions have definitive answers.

Decidable questions are those that have answers given by the framework in which they are asked:

> …decidable questions are already decided by the choice of the framework in which they are asked, and by the choice of the rules used to connect what we label "the question" with what we take for an "answer." In some cases it may go fast, in others it may take a long, long time. But ultimately we arrive after a long sequence of compelling logical steps at an irrefutable answer; a definite "yes," or a definite "no." (Foerster, 2003a, p. 293)

That is, decidable questions are those where the asking of the question invokes contexts and frameworks within which the path to an answer is set out, taking a form of self-reference where the question brings forth its own answer. Foerster gives examples from mathematics, which have value in their formal clarity, but it is important to recognise that undecidability is not an abstract issue. In all cases, it is through social interaction that the distinctions on which the question is based are drawn. Examples include disciplinarity (see discussion of astrophysics below), conventions for behaviour within a specific context, and agreed ethical principles such as a professional code, and indeed it is only within social contexts that formal mathematical systems are established. Such frameworks may be explicitly governed by rules or through implicit commitments that arise through participation in a particular community, which could include aspects of which one may be unaware.

Undecidable questions are those where the framework in which the question is asked does not invoke a path towards an unambiguous solution. Foerster uses the example of the creation of universe, an event where there were no witnesses, and which can therefore be explained in more than one way:

> For instance, the question about the origin of the universe is one of those in principle undecidable questions. Nobody was there to watch it. Moreover, this is apparent by the many different answers that are given to this question. (Foerster, 2003a, p. 292)

Foerster's focus on unobservable events is an indication of his interest in observation and science, but it is not the clearest example as it gives the impression that undecidability is an empirical matter. Challenged elsewhere by Albert Müller and Karl Müller that astrophysicists 'could now explain that, with the Big Bang, observations, conjectures and counter-conjectures may be found so that the matter of the Big Bang will become a decidable question' (Foerster et al., 2014, p. 25), Foerster clarifies how such a decidability relies on a choice of disciplinary framework:

> Why astrophysicists consider it decidable, I don't know. I know it's undecidable. I'll draw a comparison. The situation is like in chess: You choose a move, and that is the moment when the undecidable question becomes a decidable one. You're saying, we want to play a certain game now, it's called astrophysics. What are the rules? We make observations with telescopes, we build space-telescopes, we know spectroscopy. We know what Doppler wrote about wave movements, frequency movements, etc. Within these rules we want to find out how the world came into being. Thus we come to certain conclusions. That means that in the matter of beginnings, the unanswerable is a question of which game I should play. And if we all decide to play the game of astrophysics or physics or chess or checkers or backgammon, then the undecidable first decision is made. Because until then it was basically undecidable which game I should play—this, that or the other—maybe arithmetic, mathematics, or the numerical system. (Foerster et al., 2014, p. 25)

That is, despite Foerster's focus on an absence of witnesses, undecidability is not a matter of a lack of evidence and should not be conflated with empirical uncertainty. Rather, undecidability is about the kinds of questions we are asking, and the consequences of the frameworks we invoke in doing so. Whether a question is decidable or undecidable is not the same as whether an answer is available. A decision can be decidable even if one does not know the answer, while a question may be undecidable because there is no way of deciding between many viable but different ways of responding. The origin of the universe would not be made decidable should one discover some evidence—it is what is meant by the asking of the question that is undecidable.

UNDECIDABILITY, RESPONSIBILITY, AND FRAMEWORKS

The notion of undecidability connects to ethical discourse in two sorts of way. The first of these is around the ethical quality of responsibility, and it is this aspect that Foerster focuses on, and which is the clearest outcome of his paper. By reflecting on the decidability or undecidability of a question, one may trace one's responsibility within that context: it is '*only* those questions that are in principle undecidable, *we* can decide' because 'the decidable questions are already decided by the choice of framework in which they are asked…' (Foerster, 2003a, p. 293).

This is sometimes transposed into 'only we can decide the undecidable' (e.g. Glanville, 2007, p. 5), a formulation that is absent from Foerster's paper. While not necessarily in conflict, this alternative phrasing places emphasis differently, stressing responsibility for individual action ('only we…') whereas the original wording emphasises the constraints that arise because of the contexts in which responsibilities are formed ('*only* those questions…').

Foerster's distinction between the decidable and the undecidable has tended to be interpreted in a way that throws all its emphasis onto undecidable questions, with the consequence that decidable questions are positioned as uncontroversial matters of logical compulsion to be complied with. Foerster's discussion of foundational questions goes on to unpick this, showing that, ultimately, what counts as decidable rests on undecidable questions (see discussion below). The relation Foerster draws between responsibility and undecidability remains a binary one, however. Within their contexts, one is responsible for undecidable questions and not for decidable ones.

An either/ or reading of responsibility is less than helpful in practical and social contexts, where it is more meaningful to think in terms of the character and scope of responsibility changing in each case. In responding to a decidable question, I am not responsible for what the answer is, but I am responsible instead for whether any answer I give is correct within the context of the question. By contrast, with an undecidable question, in answering, I am responsible for the answer I give and for the consequences that follow from this. As an example, consider a professional code of practice. In the context of being a professional operating within such a code, I encounter it as a decidable framework. I am responsible for conforming to the code but not for what it says. In contrast, consider the same professional being part of a team writing or revising such a code, deciding its scope and wording amongst many possibilities and considerations. What and who is to be included and excluded? Whose perspective does one take on what? How to prioritise between competing values and needs? These are all undecidable questions, requiring commitments that can be made in more than one way.

In the cases of both decidable and undecidable questions, I also have responsibility for whether I give an answer or not (although in a sense not answering may be thought of as a form of answer). Not answering may be because of some shortcoming on my part, where I do not answer because I do not know how, but it may also be a deliberate refusal of the assumptions and distinctions implied by the question. I may, for instance, leave a profession rather than conform to its practices, or resign from a team developing a code of practice in protest at the way it does so.

The second type of connection between undecidability and ethical discourse is around the contexts in which one takes decisions, ethical frameworks in their various forms being a special case of these. I use the term ethical frameworks here to stand in for all the various forms that ethical discourse may take, including but not limited to philosophical theories, professional codes, boundary judgements, traditions, socially constructed norms, and appeals to authority.

While Foerster sees foundational questions of worldview as 'a good point of entry' for this discussion (Bröcker, 2003, p. 56), I see undecidability as more directly relevant to the

practical frameworks we encounter in everyday and professional contexts. For instance, there are some ethical questions, and some ways of asking ethical questions, that can be thought of as decidable, in that they require a specific, unambiguous response. Within the context in which the question is asked, one is responsible not for what this requirement is, but for whether one fulfils it or not. There are other ethical questions that can be thought of as undecidable, in that the way to respond to them has some degree of ambiguity. There are two ways in which an ethical question may be undecidable. First, because the situation is under-constrained—where there are several ways of responding that are both viable and significantly different (i.e., not merely different ways of doing the same thing). Second, because it is over-constrained—where there are no ways of responding that meet all the required criteria.

The development of ethical frameworks can be thought of as attempting to clarify undecidable ethical questions, moving them to forms of decidability. However, depending on which frameworks one refers to, one may receive quite different advice as to what to do. Thus, while invoking an ethical framework may make a question decidable, it does so by exporting the undecidability to the choice of framework. Where different frameworks align with each other in what they advise, one may pass over or negotiate the differences in their reasoning and justifications without difficulty or perhaps without even noticing. However, where conflicting courses of action are decidable within incompatible frameworks, it can be difficult to resolve between them because of the unambiguous commitments entailed by their decidability within the frameworks in which they are formed, resulting in intractable conflicts and ethical dilemmas.

The tensions between guidance given by different frameworks are most obvious in the cases of direct conflicts between incommensurable values and boundary judgements. One established way of navigating and questioning values and boundary judgements is Werner Ulrich's (1983) critical systems heuristics, which Scholte (2019) has connected to undecidability. As well as disputes of values and boundaries, frameworks may also come into conflict concerning differing conceptions of the form of practical ethical reasoning. For instance, depending on whether one thinks of some situation primarily in terms of duty, consequences, virtue, care, or tradition, there are different ways of characterising and prioritising what is at stake. Questions about which ethical frameworks are to be used thus entail further ethical questions about how they are to be negotiated and enacted (Sweeting, 2018, 2019). Foerster's warning that articulating ethics leads to moralisation, can be thought of as one such question.

FOUNDATIONAL QUESTIONS

Foerster traces undecidability back to a pair of foundational questions of worldview:

> "Am I apart from the universe?" Meaning whenever I look, I'm looking as if through a peephole upon an unfolding universe; or, "Am I part of the universe?" Meaning whenever I act, I'm changing myself and the universe as well.
>
> Whenever I reflect on these two alternatives, I'm surprised by the depth of the abyss that separates the two fundamentally different worlds that can be created by such a

> choice. That is to see myself as a citizen of an independent universe, whose regulations, rules and customs I may eventually discover; or to see myself as a participant in a conspiracy, whose customs, rules, and regulations we are now inventing.
>
> Whenever I speak to those who have made their decision to be either discovers or inventors, I'm impressed by the fact that neither of them realizes that they have ever made that decision. Moreover, when challenged to justify their position, a conceptual framework is constructed which itself turns out to be the result of a decision upon an in principle undecidable question. (Foerster, 2003a, pp. 293-294)

That these questions appear within Foerster's critique of objectivity means they are often interpreted in epistemological terms as a familiar distinction between forms of constructivism/ idealism (part of) and objectivity/ realism (apart from). While, strictly speaking, the foundational character of the questions means they precede epistemology or any other discourse (Bröcker, 2003, Poerksen, 2011), it is helpful to locate them within a context in order to explore them. While epistemology is only one way of contextualising them, it provides a useful starting point.

Thinking of these foundational questions in terms of epistemology, they can be recognised as undecidable because they concern the relation between one's understanding of one's experience and the world beyond one's experience. As Ernst von Glasersfeld (1990, p. 20) has pointed out, it is impossible in principle to verify whether this relationship is one of correspondence, because one cannot get outside of one's experience to assess the relation.

Foerster presents these questions as an either/ or choice between two distinct worldviews. He associates the 'part of' perspective with interdependence, invention, and an attitude to ethics that focuses on addressing one's own responsibility to act. The alternative 'apart from' choice is characterised as a 'popular device for avoiding responsibility' where 'the observer is reduced to a copying machine with the notion of responsibility successfully juggled away' (Foerster, 2003a, p. 293). Foerster associates the 'apart from' choice with independence, discovery, and moralisation.

While Foerster presents these questions as a blunt choice between two alternatives, the undecidability of these foundational questions also allows for a less binary reading. Whereas Foerster frames these questions as requiring a decision one way or the other, Ranulph Glanville added a third possible response, to maintain the distinction:

> My position is that I chose to try to act as a guardian of the undecidable question, guarding against the forces that seek to force a decision (one way or the other, and usually permanently) on others, as a so-called "truth:" to maintain, and then sit on the fence, rather than to decide which side to stand on. It may be that this is, in effect, the position that is necessary not only so that we can chose one side or the other, but also so that we can occupy both positions at once… (Glanville, 2006, p. 104)

Glanville is here drawing on the idea of a distinction as a space that can itself be occupied, but it is also possible to construct this idea from the self-referential structure afforded by

the way that Foerster poses these questions, which prompts their reopening whichever way they are answered (self-reference plays a similar role in Gödel's proof, although the comparison is not exact).

If I choose to understand myself as part of the world, I recognise that because of this I cannot be certain of the veracity of my choice. Being apart from the world is therefore a possibility. Indeed, Glasersfeld (1990, p. 19) noted that it would be 'perjury' for a radical constructivist to claim their theory of knowing was true. However, if I choose to understand myself as apart from the world, I must recognise that this was a choice I made, so the objectivity that follows is based on a decision that I am part of. It follows that any attempt at objectivity is inevitably inconsistent, as it cannot in itself be objective—it is something that is done by someone, dependent on particular choices and practices that involve questions that are ethical and political in character. For instance, claims to neutrality are not in themselves neutral as they are framed within particular assumptions and conventions that favour dominant worldviews and cultures (see also: Feyerabend, 1978, Harding, 2015).

It is, however, not just objectivity that can be criticised if the undecidability of the questions is maintained. Constructivism is open to its own possibilities of avoiding responsibility. It is possible, for instance, to use claims of personal responsibility to avoid the need for scrutiny—to say, for instance, that this is the situation as I see it; that those may be your facts, but these are my alternative ones, for which I alone am responsible for constructing and evaluating. I think of this as a way of avoiding responsibility by claiming it all for oneself, removing the social context through which one may be held accountable. Although it seems like the opposite of objectivity, such a position may be interpreted as a form of being 'apart from', where the world is reduced to one's own solipsistic perspective. One may note in passing, here, how the interactive focus of cybernetics may afford criticisms of both objectivity and solipsism in the same terms as each being a way of withdrawing from the world. It follows that recognising oneself as included within the framing of one's actions should not, as it is sometimes uncritically presented, be understood as a way of accounting for one's responsibilities. Rather, it is an opening to seriously consider what these are, who they are to, and whose terms they have been framed in.

Thus far I have interpreted Foerster's foundational questions as if they were epistemological. It is also possible to interpret them as speaking directly to the context of ethics in the sense of ethical frameworks. When ethical frameworks make claims as to what it is good to do, their invocation makes authoritative (decidable) demands. Yet such frameworks derive their authority from one's (undecidable) acceptance of them. In much the same way as the epistemological reading of Foerster's questions, how one positions oneself towards ethical frameworks involves questions of responsibility and its avoidance. I may, for instance, insist that my own ethical framework is justified by some authority, such as a divine command, social contract, or rational argument. But such authorities are authoritative only when I treat them as such, a step that is often left out of the claim in the same way that objectivity relies on choices and practices that it goes on to obscure. On the other hand, asserting that ethics is a personal matter can also be a way of avoiding responsibility. When someone makes a claim along the lines of 'that may be your ethics, but this is mine…', they create a way of retreating from the social context in which they become accountable. It may sound as if they are taking responsibility, but actually they are

avoiding it. Although Foerster's paper does devote a section to dialogical interaction with others, his characterisation of ethics in terms of the first person singular ('I shall…') and his invocation to keep ethics implicit may be criticised for downplaying the importance of social contexts, a full discussion of which is beyond the scope of the present paper.

UNDECIDABILITY IN THE CONTEXT OF PRACTICAL SITUATIONS

In looking at the many crises and injustices of the contemporary world, it is clear that these do not arise solely from undecidable decisions (individual actions). The most persistent are those embedded within or caused by shared assumptions that are taken for granted, creating decidable structures that come to seem as if they are inevitable, such that the best that can be hoped for is incremental improvement. Recognising this, it follows that deciding the undecidable decisions that one encounters is not enough. Decidable decisions also need to be challenged and transformed.

Foerster's discussion of undecidability in terms of foundational questions establishes the possibility of rethinking the decidable. By showing that, if you trace them back far enough, decidable frameworks ultimately rely on decisions that are themselves undecidable, Foerster undermines the apparent inevitability of existing decidable structures, making room for new possible worlds. There is little point, however, in taking everyday decisions back to in principle irresolvable debates such as that between constructivism and realism. As well as presenting a detour that is unworkable within the context of practical decision making, discussions of foundations encourage an all or nothing approach, such as that manifest in contemporary clashes between incommensurable worldviews.

Therefore, while Foerster chooses to begin with foundations, I choose to begin in the middle of things, positioning the decidable and undecidable as frames that one may move between within the context of practical situations. Such a starting point is, as I see it, a necessity if second-order cybernetics' primary move of including observers within their observing is to be relevant within (rather than about) practice.

Practical frameworks are not usually constructed from first principles. One encounters and inherits frameworks already formed within the situations that one participates in. In working as a professional or within a discipline, for instance, one is subject to various codes, norms, and assumptions that are already present. As well as those frameworks that are explicitly entered into, there are also commitments made implicitly through socialisation, education, or participation in particular communities. In these cases, one may not even notice what one has signed up to. In addition, designed artefacts (including spaces, technologies, and services) tacitly create frameworks by affording and constraining different ways of acting and living. Consider, for instance, how the ways in which public bathrooms are designed introduce, affirm, and potentially reorganise social conceptions of gender as well as responding to them (Southcott and Theodore, 2020).

Because decidable decisions are decided already by the framework in which they are asked, confronting the decidable requires these frameworks to be reinvented. Within the language of Foerster's paper, I propose thinking of this as a process of undeciding the decidable. By undeciding, what I mean to suggest is a process of reconceiving the framework in which a

decidable decision is asked such that the framework is itself undecidable, thus requiring a decision to be made as to the decidability of the decision that is at stake. That is, I am not advocating simply ignoring the decidability of frameworks that one encounters but acting in ways that gather responsibility for this, creating the potential for change in doing so.

Thought of in the context of practice, it is possible to treat decidability and undecidability as frames to move between. Beginning within the context of a decidable decision, one may ask what has been invoked within the context to make it decidable. Stepping back, one may ask whether the decisions that produced this context were decidable or undecidable. In the simplest case, consider a situation that is decidable because of a framework that is in itself undecidable, but where the choice of this framework has not been made explicit. The question of the sum of the internal angles of a triangle may be taken as an illustrative example (in this section I choose to focus on simple examples such as this in order to convey form, leaving it to the reader to imagine other applications). What makes this a decidable question in an everyday context is that Euclid's parallel postulate is assumed as a common framework without being explicitly stated, giving a decidable answer to the question of 180 degrees. However, there is more than one established geometrical system and, if one adopts a non-Euclidian geometrical framework, then the answer is no longer the same. Becoming aware of this, if I choose to return to Euclidian geometry, its status is not the same as before. Rather than the only way of doing geometry, it is now the way I have decided to do it amongst the possibilities available to me. That is, having decided the undecidable decision of the choice of framework, I am now responsible for the particular way in which the question is decidable rather than (as before) uncritically inheriting this assumption from the situation. Although this example is not the most urgent that can be given, it is analogous to situations that have distinct social consequences. Any act of curriculum design, for instance, involves choices about what to include and exclude and concerning which stances to take towards the material that is presented. When these decisions are not explicit, and it is hard for them all to be, students are educated into these assumptions as if they are inevitable, creating unexamined orthodoxies of thought and practice.

Not all decidable decisions are the direct result of undecidable frameworks. Consider a situation where the framework that makes a decision decidable is itself a result of other decidable decisions. One may need to trace back several steps in order to find undecidability. Alternatively, one may reach frameworks that one decides not to question at present. The decision not to question a decidable framework may be recognised as an undecidable decision, as one could go on and on until foundational questions are reached.

Staying with the educational context introduced above, consider how one may step back from a particular question to the purposes of education. Foerster gives this example:

> Our infatuation with trivial machines goes so far that we send our children, who are usually very unpredictable and completely surprising fellows, to trivialization institutes, so that the child, when one asks "how much is 2 times 3" doesn't say "green" or "that's how old I am" but rather says, bravely, "six." And so the child becomes a reliable member of our society. (Foerster, 2003b, p. 311)

At first sight, this example seems similar to the choice between geometrical frameworks, where there is a context assumed by the question that may be opened to other interpretations. In this case, though, whether one may entertain alternative framings depends on how one resolves questions about the wider context. What is education for? What is one's purpose as a teacher? Should I conform to what is expected? What are the consequences for failing to be 'reliable' and can these be navigated? What is in the best interests of my students? How may my actions help achieve a more desirable society? By stepping back to question these contexts, new possibilities can be envisioned whereby education is no longer trivialising. Whether one pursues these is an undecidable decision.

What seems like the same question may shift between decidability and undecidability depending on changes in context. Consider the question of which clothes to wear that one resolves each day. While there are various constraints and factors to consider (the weather, the clothes I own, what is in the laundry…), it can be considered as an undecidable question that can be resolved in more than one way, with potentially significantly different consequences, for instance in the impression I make when I meet someone. But consider how the context may make this decidable. There may be a dress code of some kind as part of an event I will attend; I may have a job that requires a particular uniform; or perhaps there are expectations within the social context of what someone like me should be wearing. Yet, in these situations, decidability arises because of the choice to conform to the expectations of the context. Perhaps I might wear something that does not conform in order to stand out or in protest.

Take for example, the Montreal police, who, having no right to strike, engaged in a long running protest about pensions by refusing to conform to their uniform and instead wearing a variety of brightly coloured trousers (Busby, 2017; Figure 1). The expectations and rules are still there, but their authority no longer holds. Within the constraints of not being able to strike, itself a decidable framework but one with much more significant consequences for disobeying, this rejection of uniform reframes protest as being possible within this context.

Figure 1. The colourful trousers of Montreal's police. Photograph by Can Pac Swire, licensed under CC BY-NC 2.0

The examples I have given in the section are intended to illustrate how decidable frameworks may be re-opened to negotiation in various ways within practical situations, without necessitating a detour via foundational questions of worldview. Each decidable decision will have its own character. Many will have good reasons for why they are as they are, but others will be worth putting in question. Some will be easily reconsidered and reframed through individual reflective practices or collaborative group processes. Others will be deeply entrenched in society, lacking transparency of origin, resistant to change, and requiring a collective reckoning that may require years of struggle to bring about. In all cases, where decidability has come from, how and why it is maintained, and what its consequences are, are questions worth asking for anyone interested in making new worlds possible.

CONCLUSION: INCREASING THE NUMBER OF DECISIONS TO BE MADE

The idea of undeciding the decidable is latent within Foerster's discussion of foundational questions and can be thought of as complementary to the invocation to decide the undecidable. It is only by first undeciding the decidable frameworks in which one finds oneself, that one can decide (become responsible for maintaining or changing) them. While what I have outlined here may therefore be understood as an extension of Foerster's position, expanding in this way involves a shift in focus from the undecidable to the decidable and a less binary attitude to locating responsibility. In actively undeciding the decidable one becomes responsible for the scope and character of one's own responsibilities, including for what one regards as within and beyond one's responsibility.

For instance, one may make undecidable decisions that establish new decidable frameworks or maintain existing ones, or which expand or constrain the boundaries of what and who are to be considered within a situation. In the examples given above, if, having undecided the frameworks inherited from the context, I then choose to return to Euclidian geometry or wearing uniform, these would be my decisions. Consider also, how working together with others to reconceive aspects of the context in which a decision is framed, such as in the example of the purpose of education, may cause the distinctions and boundaries on which the original question is based to be redrawn so that new possibilities arise.

In order to sum these differences up, I conclude by giving an alternative reading of Foerster's oft-repeated call to 'act so as to increase the number of choices' (Foerster, 2003a, p. 295). The focus on choice in Foerster's formulation means that it has tended to be understood as advocating for a liberal, individualistic form of pluralism, where one acts in ways that maximise the possibilities of others by creating viable and meaningful alternatives that they can decide between. While this approach has its value in resisting paternalism, it is not the sort of all-purpose ethical principle that Foerster's presentation of it implies. In the context of living on an earth that is both finite and riven with inequity, it matters whose possibilities are increased, whose are not, what resources are involved, and what consequences each new possibility has and for whom.

Shifting the focus from the undecidable to the decidable, one may re-read Foerster's statement by changing the meaning of the word 'choices' from 'things chosen' to 'acts of choosing'. Doing so, the statement now reads: act in ways that increase the number of decisions that are to be made, as opposed to increasing the number of possibilities to be chosen between. That is, by undeciding the contexts that make decisions decidable, additional undecidable questions arise. The more one is able to step back through the contexts in which one is acting to examine and question decidable frameworks, the more one moves away from uncritically conforming to a situation's conventions. This process supports a form of pluralism that is different to the liberal, individual sense of Foerster's statement. By reopening decidable frameworks to negotiation, one increases the number of possible worlds that can be imagined, sustained, critiqued, and lived.

Increasing the number of decisions to be made is in tension with the need to act. Within the timeframe of a practical situation, it is not possible to step back and back as far as one might want, let alone as far as is possible. The call to increase the number of decisions is not intended to excuse delay. What is needed are ways of working through which one may more effectively examine and address the context in which one is acting as one acts, within the constraints of time and resource that are available. Cybernetics would seem to have much to offer in this regard, given its longstanding concern with reflexivity. In particular, it is possible to see many potentially relevant approaches within cybernetics' developing exchanges with disciplines such as theatre, design, action research, and critical systems heuristics, where reflexivity is brought to bear in the service of social transformations (e.g. Perera, 2020, Ryland and Scholte, 2019, Scholte, 2019, 2020, Torbert and Erfan, 2020). While cybernetics has traditionally been concerned with homeostasis—with the maintenance of stability in the face of perturbations—it also has the potential to support practices that are disruptive towards seemingly inevitable structures. After all, the most

important thing afforded by being able to maintain a course, is the ability to change direction.

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REFERENCES

Bröcker, M. (2003). Between the lines: The part-of-the-world-position of Heinz von Foerster. *Cybernetics and Human Knowing,* 10(3/4)**:** 51-65.

Busby, M. (2017). A crime against fashion? Why Montreal police donned colourful cargo pants. *Guardian*, 8 December. https://www.theguardian.com/cities/2017/dec/08/crime-fashion-montreal-police-cargo-pants-pensions

Feyerabend, P. K. (1978). *Science in a free society,* NLB, London.

Foerster, H. von (1992). Ethics and second-order cybernetics. *Cybernetics and Human Knowing,* 1(1)**:** 9-19.

Foerster, H. von (1995). Ethics and second-order cybernetics. *SEHR,* 4(2).

Foerster, H. von (2003a). Ethics and second-order cybernetics, in *Understanding understanding: Essays on cybernetics and cognition.* Springer-Verlag, New York, NY.

Foerster, H. von (2003b). For Niklas Luhmann: "How recursive is communication?", in *Understanding Understanding: Essays on Cybernetics and Cognition.* Springer-Verlag, New York, NY.

Foerster, H. von, Muller, A. & Muller, K. H. (2014). *The beginning of heaven and earth has no name: Seven days with second-order cybernetics,* Fordham University Press, New York, NY.

Glanville, R. (2006). Construction and design. *Constructivist Foundations,* 1(3)**:** 103-10.

Glanville, R. (2007). The importance of being Ernst. *Constructivist Foundations,* 2(2/3)**:** 5-6.

Glasersfeld, E. von (1990). An exposition of constructivism: Why some like it radical. *Journal for Research in Mathematics Education Monograph,* 4**:** 19-29. doi: 10.2307/749910

Gödel, K. (2004). On formally undecidable propositions of principia mathematica and related systems, in Davis, M. (ed.) *The undecidable: Basic papers on undecidable propositions, unsolvable problems and computable functions.* Dover, Mineola, NY.

Harding, S. (2015). Objectivity for sciences from below, in Padovani, F., Richardson, A. & Tsou, J. Y. (eds.) *Objectivity in Science: New Perspectives from Science and Technology Studies.* Springer International Publishing, Cham. doi: 10.1007/978-3-319-14349-1_3

Perera, D. (2020). Wicked problems, wicked play: Fun machines as strategy. *FormAkademisk - Research Journal of Design and Design Education,* 13(2). doi: 10.7577/formakademisk.3378

Poerksen, B. (2011). Ethics of enabling ethics. *Cybernetics & Human Knowing,* 18(3-4)**:** 143-149.

Ryland, M. & Scholte, T. (2019). Rehearsing resilience (and beyond): Facilitating second-order observation of conflict in the university workplace through forum theatre. *Kybernetes,* 48(4)**:** 740-750. doi: 10.1108/K-11-2017-0459

Scholte, T. (2019). Heuristics for the undecidable. *She Ji: The Journal of Design, Economics, and Innovation,* 5(4)**:** 379-382. doi: 10.1016/j.sheji.2019.11.011

Scholte, T. (2020). A proposal for the role of the arts in a new phase of second-order cybernetics. *Kybernetes,* 49(8)**:** 2153-2170. doi: 10.1108/K-03-2019-0172

Southcott, T. & Theodore, D. (2020). Interview with Susan Stryker. *Journal of Architectural Education,* 74(2)**:** 333-336. doi: 10.1080/10464883.2020.1790949

Sweeting, B. (2018). Wicked problems in design and ethics, in Jones, P. H. & Kijima, K. (eds.) *Systemic design: Theory, methods, and practice.* Springer Japan, Tokyo. doi: 10.1007/978-4-431-55639-8

Sweeting, B. (2019). Applying ethics to itself: Recursive ethical questioning in architecture and second-order cybernetics. *Kybernetes,* 48(4)**:** 805-815. doi: 10.1108/K-12-2017-0471

Torbert, W. R. & Erfan, A. (2020). Learning for timely action: An introduction to the cybernetics of collaborative developmental action inquiry (CDAI). *Cybernetics & Human Knowing,* 27(2)**:** 81-90.

Ulrich, W. (1983). *Critical Heuristics of Social Planning: A New Approach to Practical Philosophy,* Haupt, Bern.