

Wicked Problems in Design and Ethics



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Abstract While the relationship between ethics and design is usually thought of in terms of the application of the former to the latter, it is not as if ethics is a settled body of theory that can authoritatively guide design practice. Depending on which theories or ideas we refer to, we receive different guidance as to what to do. Indeed, design may have as much to contribute to ethical theory as vice versa. This essay builds connections between design and ethics, looking to the similarities of structure between wicked problems in design and those dilemmas that are of central concern in normative ethical theory. Understanding design and ethics in mutual terms, ethical questions in design need not be understood in terms of external limitations or trade-offs between competing priorities. Moreover, the way designers cope with the ethical challenges presented by wicked problems may inform how we approach complex ethical challenges in other contexts, including some of those that arise within ethical discourse itself.

Introduction

The relationship between ethics and design is usually thought of in terms of applied ethics—as the application of normative ethical theories to design practice in order to navigate issues such as agency, professional ethics, and our relationships to technology and the environment. These considerations are vital given the significant impact that designers’ decisions have on others, and there have been calls for designers to engage with ethical philosophy in order to grapple more fully with the ethical challenges they face (e.g. Schrijver, 2013; Spector, 2001). However, there are reasons to be cautious about seeing the relation between ethics and design primarily in terms of the application of the former to the latter. In addition to the general care that needs to be taken in understanding design in terms of other areas of theory (Glanville, 2004a, 2014a), such an approach implies that ethical

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considerations are separate to design questions. This is not borne out in practice, where designerly and ethical questions are closely intertwined (Lloyd, 2009; van de Poel, 2001) and virtues may be developed through design activity (Jonas, 2006). In any case, it is not as if ethics is a consistent body of theory that can straightforwardly act as an authority to guide design practice. Depending on which theories or ideas we refer to, we receive different and sometimes directly conflicting guidance as to what to, do. As Terry Eagleton (2003, p. 229) has noted, we might expect to agree on general principles and diverge on particulars, yet we have no common view on many everyday ethical questions. Even with those questions where we have widespread agreement over an action being ethically good or bad, there is little agreement on why this is the case. Whether we understand this state of disagreement as a conflict between objective goods (Berlin, 1998), an inevitable property of our subjectivity (Sartre, 1948), or resulting from the dissipation of any overall idea of the good life with which to make different goods commensurable (MacIntyre, 1985), the situation in which we find ourselves is that anything to which we refer to help clarify an ethical question is itself contestable.

There are significant parallels and overlaps between this and the concerns of the present volume in relating systems thinking and design. Both ethical philosophy and systems thinking offer support to designers in addressing the complex challenges they encounter. Indeed, some of the most pressing contemporary issues that designers face are both ethical and systemic in their complexity (consider, for instance, climate change or the complexities of sociotechnical systems). The history of the relation between design and systems thinking is also pertinent. During the 1960s, in what is usually referred to as the design methods movement, ideas from systems theory, cybernetics, the philosophy of science, and elsewhere were imported into design in an attempt to rationalize it. This lost sight of what was special about design in the first place and met with little success. Since that time, design's relationship to these fields has become more balanced, with the seemingly messier qualities of design having come to be seen as contributing to them as well as vice versa (Glanville, 1999, 2007b, 2014b, 2014c; Jonas, 2014; Jones, 2014a, 2014b; Sevaldson, 2017; Sweeting, 2016a). This has led to a more productive relationship, offering a pattern that could be followed in relating design and ethics: In addition to drawing on ethical theory to guide design practice, are there ways we might look to design activity with a view to informing ethics?

It is such a proposal that I put forward here, focusing on the systemic aspects of design and ethics in order to align them with each other. I draw on two main points of connection. The first is Horst Rittel and Melvin Webber's characterization of the complex situations that designers encounter as "wicked problems" (Rittel, 1972; Rittel & Webber, 1973, 1984), one of the most prominent and influential intersections of design and systems thinking, which also relates to ethical issues in content and structure. The second is the way that designers cope with this complexity, as it has been understood through the field of cybernetics. In particular I draw on the close analogy between cybernetics and design that has been articulated by Ranulph Glanville (2007b, 2009, 2014b), building on the Conversation Theory of his mentor Gordon Pask (1976), and the ethical reflections of cybernetics as developed by Glanville (2004b, 2005) and Heinz von Foerster (1991, 2003c).

Wicked Problems

One way of characterizing the complex situations that designers typically encounter is as what Rittel and Webber, writing originally in the context of planning, called “wicked problems” (Rittel, 1972; Rittel & Webber, 1973, 1984). Wicked problems are those that cannot be addressed using conventional methods of problem solving because of their uncertain boundaries, conflicting and incomplete requirements, and systemic complexities, such that the attempt to solve one problem may create others elsewhere. This contrasts with those well-defined problems that Rittel and Webber (1973, p. 160) label as “tame,” which are typically associated with the hard sciences, rule-governed games such as chess, and highly regimented contexts such as the military. In the period of scientific and technological optimism that followed the Second World War, attempts had been made to apply competencies from these realms to more socially complex domains such as design. Rittel and Webber’s analysis is notable for explaining the lack of success of such attempts, diagnosing those characteristics of such situations that preclude approaches that rely on being able to fully analyse the situation or define goals at the outset.

Rittel and Webber (1973) formulate this in ten¹ concise and interrelated points, each stressing the difference to the sorts of methods applicable to tame problems:

1. “There is no definitive formulation of a wicked problem” (Rittel & Webber, 1973, p. 161).

Whereas tame problems can be exhaustively formulated in a way that contains all the information necessary to form a solution, for instance, as with the description of a chess puzzle, wicked problems are typically presented in an ambiguous and incomplete manner. Whichever way we initially address a wicked problem, it leads in turn to new questions and the need for further information. This means that a large part of addressing wicked problems is the formulation of the problem itself. Indeed, rather than moving from problem to solution, the “process of formulating the problem and of conceiving a solution (or re-solution) are identical, since every specification of the problem is a specification of the direction in which a treatment is considered” (Rittel & Webber, 1973, p. 161). Further questions emerge from the process of addressing the initial problem and cannot be anticipated ahead of time without prior “knowledge of all conceivable solutions” (Rittel & Webber, 1973, p. 161), which, if it were possible, would mean the problem was no longer wicked (c.f. feature 6).

2. “Wicked problems have no stopping rule” (Rittel & Webber, 1973, p. 162).

With tame problems there is a definite end point where it is possible to know that an answer has been reached. With wicked problems the question of when and how to stop is much more arbitrary. Because the attempt to solve a wicked problem coincides with the attempt to understand it (feature 1), a process that has no obvious boundaries, our understanding and proposals are always provi-

¹While in Rittel’s (1972) *On the Planning Crisis* the equivalent list has 11 entries, Rittel and Webber’s (1973) *Dilemmas in a General Theory of Planning* merges the first two of the list.

sional. We can stop at any point where we consider our proposal “good enough” (Rittel & Webber, 1973, p. 162), and, should we wish to, we could always continue to try to develop it further, or explore alternatives, were it not for criteria or limitations that are external to the problem itself, such as a lack of time or fees.

3. “Solutions to wicked problems are not true-or-false, but good-or-bad” (Rittel & Webber, 1973, p. 162).

Whereas a tame problem will have a right answer (or set of right answers) according to established criteria, potential resolutions to wicked problems will only be better or worse, good enough or not good enough, viable or unviable.² These sorts of judgements may even vary with different stakeholders and criteria (Rittel, 1972, p. 392)—a solution may be good for one person but not for another, and so some solution may possibly be *both* better *and* worse simultaneously in different terms. Any proposed solution to a wicked problem is therefore not just provisional in the sense that one could keep working to improve it (feature 2) but also deeply contestable, especially given the uncertain boundaries (feature 1) and the resultant likelihood for new criteria to emerge and existing ones to change or lose relevance, bringing previous assumptions into dispute (c.f. feature 4). As Rittel and Webber (1973, p. 160) note, wicked problems “are never solved. At best they are only re-solved—over and over again.”

4. “There is no immediate and no ultimate test of a solution to a wicked problem” (Rittel & Webber, 1973, p. 163).

With a resolution to a tame problem, it is possible to identify points where its consequences are clear and evaluation can take place. Solutions to wicked problems, however, have consequences that unfold over long periods of time (consider, for instance, the way that buildings tend to outlive their initial uses, users, designers, and clients). One can only make a final judgement after all the consequences have played themselves out, yet, as there is no time limit to this, no such judgement can be made. Any evaluation of a resolution to a wicked problem is therefore as provisional as the resolution itself (feature 2), as further consequences may arise in the future that outweigh those that have already occurred.

5. “Every solution to a wicked problem is a ‘one-shot operation’; because there is no opportunity to learn by trial-and-error, every attempt counts significantly” (Rittel & Webber, 1973, p. 163).

Whereas with tame problems one can always start over again, one cannot, for instance, build a motorway to see if it is a good idea to do so. In addition to the resources that are consumed in the process and the significant effects on people’s lives (c.f. feature 10), in enacting a solution, one changes the substance of the problem itself. It is not, therefore, possible to work by trial and error as even if it were possible to remove previous solutions, one cannot return to the

²Note that the basic criterion of viability will often still be tough to meet. Wicked problems may have no right answers, but they still have plenty of wrong ones.

original situation because the history of implementation and removal remains and what was learnt from the earlier attempt may not still be applicable.

6. “Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan” (Rittel & Webber, 1973, p. 164).

Wicked problems cannot be stated as a finite list of options for consideration. Instead, “anything goes”³ in terms of potential approaches, and “any new idea for a planning measure may become a serious candidate” (Rittel & Webber, 1973, p. 164). Resolving a wicked problem is therefore not just a matter of comparing various established possibilities with each other and settling on the best—or least worst—amongst them.

7. “Every wicked problem is essentially unique” (Rittel & Webber, 1973, p. 164).

Although one can learn about the nature of wicked problems generally, each one is individual, and successful strategies cannot be directly applied from a past situation to a new one. There can therefore be no universally applicable method for solving wicked problems, although we can repeat strategies at a more general level.

8. “Every wicked problem can be considered to be a symptom of another problem” (Rittel & Webber, 1973, p. 165).

The interdependency of wicked problems means it is not clear which problem it is best to work on. Approaching the situation on a more general level may make it harder to achieve change. Yet, addressing more specific issues risks treating the symptoms rather than the cause, while incremental improvements may also have unforeseen negative consequences elsewhere in the system and in the system overall, such as has become especially evident with human attempts to intervene in ecological systems and environmental crises (see, e.g. G. Bateson, 2000; M. C. Bateson, 2005).

9. “The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem’s resolution” (Rittel & Webber, 1973, p. 166).

Because of their incomplete and uncertain formulation (features 1 and 8), it is possible to explain wicked problems in many ways, and these explanations cannot be definitively resolved between because the situation is unique and there is no opportunity for full testing (features 5 and 7). Given that the formulation of the problem coincides with the search for a solution (feature 1), this contestable choice of explanation is instrumental in what resolution we propose and different characterizations of the problem may lead to conflicting prescriptions for action.

10. “The planner has no right to be wrong” (Rittel & Webber, 1973, p. 166).

Unlike science, where progress is generated through the refutation of hypotheses and so error is an integral and acknowledged part of the process, the

³This phrase recalls that of Paul Feyerabend (1970, 1993) in his critique of scientific method. Rittel and Feyerabend were colleagues at UC Berkeley. On the parallels between their arguments, see Sweeting (2016a).

effects of resolutions to wicked problems matter a great deal to the people they affect. This aspect leaves designers in a bind when considered with (feature 3)—there is no way to be right but no right to be wrong. Thus, the impossibility of being right does not support being unrigorous and irrelevant or acting only out of personal preference.

Given that “all essential planning [design] problems are wicked” (Rittel, 1972, p. 392) rather than tame, these ten features have profound consequences for the methods that designers can employ and for the status of the resolutions and evaluations that they put forward. There is insufficient clarity at the outset to use methods that rely on exhaustive analysis and information gathering or to define goals at which to aim, ruling out forms of rational linear problem solving or optimization that are applicable in more constrained contexts (feature 1). Methods such as trial and error (feature 5) and comparative analysis (feature 6) are inapplicable, one cannot rely on precedent (feature 7) or resort to personal preference (feature 10), and even incremental improvement has significant limitations (feature 8). Moreover, as it is not clear which problem is to be addressed (features 8 and 9), apparently conclusive options for resolution are themselves contestable, as they are dependent on how the situation is characterized.

Conversation and Design

Underlying each of the features that Rittel and Webber describe is the way that design is always concerned with creating the new. It follows that it is not possible to fully analyse the situation in advance or to definitively frame the problem at hand because new questions, and with them new criteria, emerge in the process as the situation is explored. Given that the purpose of design is to transform an existing situation into a new one in some way, it is, in effect, design activity itself that leads to the wickedness of the situations that designers encounter. This means that designers encounter wicked problems as a matter of course, and from their point of view, it can sometimes be difficult to see what the fuss is about. This is not to say that designers generate solutions to wicked problems—indeed the point of wicked problems is that they cannot be solved (features 2, 3, and 4). Rather, designers transform them, reformulating the situation to create different possibilities and relationships, and it is in coping with ill-defined situations such as these that designers can claim disciplinary expertise. That designers can approach such situations with confidence is due to the distinctively interactive way in which they work. This is often thought of in terms of a conversation that designers hold with themselves and others, such as in Schön’s (1991, p. 76) characterization of design as a “reflective conversation with the situation” and the accounts of many others (e.g. Cross, 2007; Dorst, 2015; Dubberly & Pangaro, 2009, 2015a; Gedenryd, 1998; Glanville, 2006, 2007b, 2009; Goldschmidt, 1991; Jones, 2010; Khaidzir & Lawson, 2013; Lawson, 2004; Pangaro, 2008).

One way of exploring this further is via cybernetics, a field where conversational forms of interaction are of central concern. In particular, Glanville (2006, 2007b, 2009), whose work I take as a foundation for my own account here, has established a close analogy between (1) conversation, understood through the work of cybernetician Gordon Pask, his mentor, and (2) the core design activity of sketching, which Glanville takes as characteristic of what is distinctive about design more generally.⁴ Both sketching and conversation are circular processes, with evaluations of previous actions influencing present ones. In sketching, this circularity is created by our shifting perspective between looking and drawing, paralleling the turning around between listening and speaking in a conversation. The etymology of conversation reflects this: To converse is “to turn oneself about,” a phrase that historically has held social and ethical connotations in the sense of “keep company with” and one’s “manner of conducting oneself in the world or in society” (Conversation, n.d.; Converse, n.d.).

As is familiar from our everyday experience, the direction of a conversation tends to evolve as it continues, heading in ways that cannot be predicted in advance. In Pask’s (1976) Conversation Theory, this tendency towards the new follows from the way that meanings are not transferred between participants but, rather, participants construct their own understanding of the understanding of others, with the process taking the recursive form of “what I think of what you think I think, etc.” (Glanville, 1993, p. 217). For instance, if, in a two-person conversation, I begin by presenting some idea, the other participant does not simply have this transferred to them but builds their own understanding of what it is that I mean. They then present what they have understood back to me, and, again, I construct my own understanding of their presentation. I can then compare this understanding (what I understand of what they understood) to what I originally meant to communicate. Even if we continue this process in order to align our respective understandings, they remain separately constructed. This conversational mechanism allows us to act as if we understand the same thing without the need for any message containing this understanding to be passed between us, allowing for the coordination of communal understanding while also maintaining and establishing difference between participants. The maintenance of this difference means that conversation is not just (and often not even⁵) a way to reach agreement about existing ideas. It is also a way to generate new ones: whether directly from our understanding of what is shared with us; through misunderstanding, where we see an idea in what someone says that was not intended; or where we learn what is implied by our own ideas through understanding how they are interpreted and understood by others.

⁴On the relation between cybernetics and design, see also, e.g. Dubberly and Pangaro (2007, 2015a, 2015b), Fischer (2015), Fischer and Richards (2017), Furtado Cardoso Lopes (2008, 2009), Gage (2006, 2007), Glanville (2007a), Glanville and Sweeting (2011), Herr (2015), Jonas (2007, 2015), Krippendorff (2007), Krueger (2007), Pask (1969), Pratschke (2007), Ramsgard Thomsen (2007), and Sweeting (2015a, 2016a).

⁵While we can try to reach agreement, we will often abandon the attempt either through frustration or, alternatively, through the agreement to disagree (Pask, 1988, p. 85).

Similarly to the combination of speaking and listening in conversation, design combines the making of proposals with evaluating and understanding them. The circular process formed by these two aspects is more than one of iterative improvement or optimization against set criteria. Just as conversation can change course or develop new questions to explore rather than just leading to agreement, designers review and revise not just their proposals but also their understanding of the situation for which these proposals are intended. This can be seen in the core design activity of sketching, where designers simultaneously play the roles of speaker (drawing) and listener (looking), continuously switching between the two. By externalizing their thoughts through a medium, designers see more in what they have drawn than they originally intended or understood, generating new possibilities for proposals or identifying further aspects of the situation that need to be taken into account.

While there are many other aspects to what designers do, it is this conversational way of working, most evident in sketching but characteristic of design activity more generally, that makes design distinctive as an approach to complex and ill-defined situations such as wicked problems. Whereas forms of problem solving that rely on analysing the problem or setting goals at the outset are inapplicable with wicked problems, designers bypass such difficulties by moving quickly to the making of proposals and reflecting on and evaluating these to explore and understand the constraints and opportunities of the situation. This allows them to co-evolve their understanding of the situation with their ideas about how to change it, addressing questions of which problem to address (features 8 and 9) and how it is to be formulated (feature 1) as part of this process (Cross, 2007; Dorst, 2015; Dorst & Cross, 2001).

It follows that designers' proposals and any claims made about them are always contestable and provisional (features 2, 3, and 4). While this is a concern given the impact of designers' decisions on others (feature 10), it can also be thought of positively in the light of this way of working, as leading to more open-ended explorations and new possibilities (Glanville, 2011), similarly to how conversation, having no predetermined script, develops in directions that cannot be foreseen. Indeed, this tendency towards the new is crucial given that, with wicked problems, each situation is unique and there is no enumerable list of possibilities from which to select a solution (features 6 and 7), and also because designers are concerned with the new in any case, in the transformation of existing situations and the aesthetic qualities of novel environments.⁶ If the situation could be resolved with certainty, there would be no need and no opportunity for what design can bring. Indeed one of the characteristic activities of designerly problem solving is the tendency to treat even straightforward problems as if they were ill-defined (Cross, 2007, p. 100; Thomas & Carroll, 1979), a strategy that both opens up new possibilities and guards against the prema-

⁶“Delight” has been one of the key characteristics that architects try to achieve in their designs, as noted in the earliest surviving text on architecture, Vitruvius' *Ten Books on Architecture* (I.iii.2, trans. 1624). Glanville often associates this with novelty (e.g. Glanville, 2007b, p. 1178). In this he follows Pask's (1969, 1971) approach to aesthetics, which stresses the importance of novelty or surprise value.

ture taming of problems. Thus, while there are no universally applicable methods for wicked problems (feature 7), the conversational way in which designers work is a transferable strategy through which specific responses can be developed for each unique situation.

While designers cope with many of the challenges of wicked problems as a matter of course, the way that every solution to a wicked problem is a one-shot operation (feature 5) remains a significant difficulty, as does the tension between the contestability of designers' proposals and the significance of their impact on others (feature 10). These difficulties are particularly the case at larger scales, such as with architecture or urban design, where there are significant difficulties in identifying affected stakeholders. As one cannot (usually) build a building just to test out a possible solution,⁷ designers work around this by using media, at various levels of abstraction, to develop and test their ideas before implementing them. This reliance on media can lead to significant difficulties compared to scales where prototypes can be tested more fully, such as the criticism of a building as one that “looks good on plan” and the way that the abstractions of architectural drawing conventions distance design decisions from the situations that they create and impact (Till, 2009). Yet, it is always some form of design—and so some sort of modelling through media—that we turn to when faced with one-shot operations in order to try to predict how our actions will work out, including their effects on others. The question of how to manage or mediate this asymmetrical agency—where the taking of design decisions is distanced from those that these decisions affect—is a central issue at stake in how design is practised and one I return to below.

Wicked Problems and Ethical Dilemmas

Rittel and Webber's original account of wicked problems was concerned with ethical issues, and this is part of their difficulty.⁸ The connections are multilayered. As design processes and their outcomes tend to be interwoven with ethical concerns of one sort or another (e.g. Chan, 2015; Harries, 1997; Lloyd, 2009; Sweeting, 2016b; van de Poel, 2001), ethical questions or criteria may be part of what constitutes the wicked problem, either in terms of straightforward constraints or questions that are themselves matters of ongoing debate amongst those they concern. In addition, wicked problems raise ethical considerations even where these are not apparent within the substance of the problem itself. For instance, even those design questions that could be regarded as being solely matters of technical efficiency or aesthetic

⁷A notable exception to this is the work of Cedric Price. His prominent but unrealized Fun Palace project, to which Pask was a significant contributor, can be thought of as a proposal for an ongoing enquiry into its own purpose. Price regarded architecture as “too slow to be a problem solver” and sought to embed the design process in buildings themselves (Price, 2003, p. 136).

⁸Note, though, that the wickedness of wicked problems is not meant to imply any ethical wickedness but, rather, complexity (Rittel & Webber, 1973, pp. 160–161).

preference may have unforeseen impacts on other parts of the system (feature 8), while the way in which any question is addressed raises ethical issues of its own in terms of the asymmetry of agency between stakeholders (feature 10). In addition to these connections to ethics in terms of content, there is also one in terms of structure. In their contestable and uncertain framing (features 3, 8, and 9), wicked problems resemble those dilemmas with which normative ethics is both most concerned and confused.⁹ This is not to say that all ethical questions are wicked but that with tame questions in ethics being easily solvable, it is with the wicked ones, those that present us with dilemmas to which there is no clear answer, that we look to normative ethical theories for guidance.

Ethical dilemmas typically involve conflicting premises and criteria, such that what action to take is contestable. Alasdair MacIntyre (1985, pp. 6–7), for instance, describes a series of familiar contemporary debates that are characterized by the clash of contradictory positions that follow from premises that are in themselves reasonable but which are incompatible with each other. It might be countered that the contestability of such situations may be resolved through one theory or another. For instance, we might make the conflicting premises commensurable with each other, either through some form of consequentialist calculus, such as in utilitarianism, or through a unified conception of the purpose of human life, such as proposed by MacIntyre. Alternatively, we might apply moral rules discerned from rational thought, divine revelation, or tradition. To be sceptical towards such approaches is not necessarily to commit to relativism or to an equivalence of all values, which, indeed, can be thought of as further attempts to remove contestability. As Isaiah Berlin (1998) has cautioned, our tendency to assume that there will be one solution to such questions can obscure the way that different goods may be incompatible with each other. Moreover, the plurality of ways to *tame* (using Rittel and Webber's term) ethical dilemmas is part of their difficulty. We may have many ways in which to come to definite answers to ethical questions, but these follow from different characterizations of the same situation and so lead to quite different proposals for how to act. We have no authoritative way to choose between these approaches: As with wicked problems in design, proposed solutions may be both better and worse in different terms, and the "choice of explanation determines the nature of the problem's resolution" (Rittel & Webber, 1973, p. 166).

The remaining features of wicked problems are also relevant. While there is a tendency in ethical philosophy to characterize such dilemmas as forced choices between competing alternatives in order to clarify what is at stake between different principles, choices are rarely so clear in practice and one can, and may need to, devise new ways forward or improve upon existing options (features 2 and 6) (Whitbeck, 2011). While precedent may be a useful guide to many complex ethical situations, the contestability of ethical dilemmas is such that which precedent to

⁹Whitbeck (2011) has put forward a similar analogy in terms of the ill definition of design questions and practical ethical reasoning. My account here supports this view but takes a different path, looking to underlying parallels in terms of structure and addressing normative as well as applied ethics.

invoke is itself a matter of dispute, and there is no guarantee that it would have the same outcome in any case (feature 7). We clearly cannot work at ethical questions by trial and error or empirical experiment because of the impact this has on others (we have no right to be wrong; feature 10) and also because any action changes the substance of the question (each situation is a one-shot operation; feature 5). Moreover, the complex interrelation of different situations means that resolving one ethical problem may raise further ethical questions to consider or cause unexpected consequences elsewhere or in the future (features 1, 4, and 8).

Even if it is argued that the incommensurability of many ethical dilemmas is circumstantial and could be clarified, it is evident from the ethical challenges that designers face that at least some ethical problems are wicked. That this is so challenges the idea of normative ethics itself. While normative ethical theories seek to give us definitive guidance, or at least clarification of what is at stake in some situation, they cannot do so with wicked problems, which have no right answer or definitive formulation. While it could be argued that this is only a quality of situations as we encounter them, and that normative ethics deals with questions of what is right in principle rather than practically what to do in some particular situation, the idea of what is good conduct must refer to an action that it is possible to take in a situation as we find it. To separate ethical theory from the actuality of circumstance assumes an unworkable objectivity, akin to the sorts of linear approaches to design that Rittel and Webber critiqued as only possible given an implausibly complete description of the situation.

Indeed, neither of the two most commonly articulated positions in normative ethics, consequentialism and deontology, can in principle guide us with wicked problems. The reasons for this mirror the limitations of attempts to rationalize design using deductive problem solving or techniques such as optimization. Consequentialist ethical theories involve the optimization of our actions against a predefined overall goal. Yet, given that a wicked problem has no definitive formulation, there is no clear goal against which to optimize. While designers are rarely short of criteria that can be applied, these are often incommensurable or even in direct conflict with each other due to limitations on space or resources with the result that the attempt to optimize some rather than others is problematic. We may be able to optimize individual aspects, such as structural performance, environmental efficiency, or cost, but there is no way in which we can take this approach to the design task as a whole because of the incomplete and changing nature of its criteria and aims and the tendency of these aims to be in conflict with each other in any case. Moreover, it is not clear how one may evaluate resolutions to wicked problems in terms of their consequences: Even if the end does justify the means, it is arbitrary what we take as an end as there is no ultimate test (feature 4) and the consequences of actions can be manifold and unpredictable (feature 8). This is in part because of the complexity of design tasks, but also because of the way that design's purpose is closely related to our own—as noted in accounts of architecture such as those of Nicholas Negroponte (1970, p. 69; 1975, p. 135), Pask (1969), and Dalibor Vesely (2004, p. 5)—and so to the ambiguities of our own goals. Negroponte, the concerns of whose Architecture Machine Group parallel many of those of Rittel and Webber, goes as far as to say

that optimization is “extremely antagonistic to the nature of architecture” (Negroponte, 1975, p. 189) and compares design to the game of croquet in Lewis Carroll’s (2001, pp. 99–114) *Alice’s Adventures in Wonderland*, where the game is continually and unpredictably changing as all its elements are alive and so learn and adapt as play continues (Negroponte, 1970, p. 69). Likewise, while deontological approaches to ethics require that we conform to predefined rules, such an approach cannot be applied to wicked problems. The situation of a wicked problem is not fully known and is, in any case, transformed into a new one through designers’ action with the result that, even if one had rules to follow, it is not clear which rules to apply. As Negroponte has put it: “any axiom or rule can find a situation where it will fail or generate disaster when blindly executed as a truism” (Negroponte, 1975, p. 33).

While deontology and consequentialism may still have much to contribute in particular circumstances, the sorts of reasoning on which they rely resemble approaches that are unworkable with wicked problems and may even be counterproductive: With wicked problems “proposed ‘solutions’ often turn out to be worse than the symptoms” (Churchman, 1967, p. B-141). This has significant consequences for design ethics, and, given the parallels between wicked problems and ethical dilemmas, we should also be wary of the claims of these and similar theories to guide action in complex ethical situations more generally.¹⁰ Ethical theory has been criticized for its tendency to treat ethical questions from the point of view of an idealized external spectator or judge rather than from that of the agent within the situation (Hampshire, 1949; Varela, 1999; Whitbeck, 2011). In so doing it echoes the weaknesses of the design methods movement in its attempt to rationalize design, as critiqued by Rittel and Webber. In moving away from the attempt to base design upon science, theorists such as Cross (1982), Glanville (2014c), Schön (1991), and Bruce Archer (1979) developed an understanding of design’s disciplinary foundations in its own designerly terms. Glanville (1999, 2014c) went as far as to argue that an understanding of design might inform science, inverting the more usual hierarchy between the two. The similarities between wicked problems and ethical dilemmas, together with the confidence with which designers approach the former, suggest that a similar approach might be taken in the case of design and ethics. We might therefore look to design to inform ethics as well as vice versa. One avenue for this is that of practical ethical reasoning. Caroline Whitbeck (2011) has suggested that design might serve as an example for the sort of practical problem solving that has been neglected in ethical theory. Some of the specific techniques that designers use to structure problems might even be directly applied to aspects of applied ethical questions (Dorst & Royakkers, 2006). The parallels between ethical dilemmas and wicked problems that I have outlined support such suggestions but also open up further possibilities, some of which I explore in the remaining space of this essay.

¹⁰Consequentialism and deontology are not the only approaches to normative ethics. Alternatives such as virtue ethics, pragmatic ethics, or care ethics are more compatible with wicked problems. However, there still remains the issue that different approaches imply different responses and there is no way to resolve between them.

No Way to Be Right, No Right to Be Wrong

As noted above, designers have “no right to be wrong” (Rittel & Webber, 1973, p. 166) because of the significant impact their actions have on others, yet they have no way to be right, as design questions have no right answers or ultimate tests. While the other features of wicked problems are all ones that designers deal with largely as a matter of course, the asymmetry of this situation—between those who have agency over design decisions and those who live with their effects—leaves designers in a bind from which they cannot easily escape. This asymmetry is not problematic in itself. Where some question either has an uncontroversial right answer or where it can satisfactorily be regarded as a matter of a designer’s preference, its asymmetry is of little consequence. For instance, there are many design decisions where designers are free to exercise their judgement in one way or another, while various technical questions, such as the variety of roofing material that is specified for a building or which of various possible structural systems is employed, can be resolved in any of various ways so long as they work. These are examples of tame problems, and while they may involve ethical issues, for instance, regarding professional ethics, they do not present us with the sort of ethical bind with which I am concerned here. However many design questions are not satisfactorily a matter of preference as they impact on others in ethically significant ways, but neither can they be resolved objectively, with the result that the relationship between designers and those they design for is paternalistic. While not all decisions that designers encounter are like this, many are and there is not a clear boundary between those that are and those that are not. Indeed, even the choice of roofing material can involve much wider implications.

This asymmetry is especially present in designing architecture, on which I focus here for this reason, as well as because it is the discipline in which I myself sit. Buildings are of a scale both intimate enough to be entwined with everyday life and large enough to be unavoidable. The design of architecture is therefore not solely a matter for its designers. Yet, it is largely for the same reason—architecture’s impact on others—that designing architecture involves wicked problems and cannot be settled objectively. Despite not being a matter of personal preference, in many instances it can only be a matter of opinion. While in similar situations in everyday contexts we will often try to find some consensus amongst all those who will be affected by the decision, such an approach is impossible to achieve in designing architecture where we cannot possibly consult every stakeholder (consider, for instance, the passer-by and the future user), let alone find agreement amongst them. While one can try to bridge the asymmetry of the design process, this can be difficult to achieve and brings its own problems. Strategies such as self-build, user-customization, or responsive technologies rearrange the relationships between designer and designed-for, but similar questions reappear regarding the design and implementation of such processes and systems. Participatory forms of design, such as those developed by Rittel himself (Werner & Rittel, 1970), look to address this. While such approaches have proved valuable in specific contexts such as healthcare

(e.g. Sanders, 2016), they are difficult to apply more generally in architecture because of its wide impact and are often regarded as being in conflict with design, either as an amelioration of it or a radical innovation. In any case these approaches do not always lead to genuine participation or significant interaction. Sometimes consultations are participative in appearance only, while even the most genuine of attempts can struggle because of the difficulty of the task. In particular, they can fail to take account of stakeholders who are less able to articulate themselves or who are as yet unidentifiable, an important consideration as a building tends to outlive its initial users and clients. While there are various ways in which this asymmetrical relationship can be arranged, it is an inevitable part of designing architecture, something to be coped with rather than solved.

This ethical challenge reflects back on ethics itself, wicked problems being not just analogous to ethical dilemmas but also involving them. In the same way that it is not just the outcome of a design process that is of ethical concern but also the way in which that process is conducted, so too it is the way we speak and reason about ethical questions not just their resolution that is ethically consequential. That is, while ethics is a reflection on good ways in which to act, its discourse is itself an activity and so something to which ethical considerations and questions apply. It is not common to turn ethics on itself in this way. As normative ethical theories and moral codes are put forward on the basis that they give guidance as to ethically good actions, they do not invite reflection on how they themselves are discussed or propagated, with such issues tending to be hidden under the catchall of application. Yet, to put forward an ethical theory or moral code can involve a similar bind to that faced by designers in encountering wicked problems. In addition to being significant in its intended impact, ethical reasoning is often also contestable (as discussed above) and becomes asymmetric where claims are made on others. The proponents of a moral code or ethical theory understand what they put forward as being true, removing one element of the bind. Yet with wicked problems—and so with many of the situations where designers seek ethical clarification and with some of the central questions in ethical theory itself—all resolutions are contestable, and claims made on others therefore have a tendency to become moralizing or paternalistic.

In addressing this sort of self-reflexive topic, it makes sense to turn again to cybernetics, a field that has often been concerned with those situations where a domain is applied to itself. This has included its application to its own practice in the development of the “cybernetics of cybernetics,” or “second-order cybernetics,” as suggested by Margaret Mead (1968) and developed by von Foerster (1995, 2003a) and others in ways that have established connections to ethical concerns. Indeed, it is consistent with von Foerster’s overall project to understand his (von Foerster, 2003c) approach to ethics in terms of the application of ethics to itself.¹¹ Von Foerster stresses our interdependence with the world and our resulting responsibility for the claims we make about it and the actions we carry out within it. We cannot

¹¹ This aspect of von Foerster’s thinking, where domains of research are applied to themselves, has recently been re-emphasized under the heading of “second-order science” (Müller & Riegler, 2014; Riegler & Müller, 2014, 2016).

view the world independently of our involvement, this being a contradiction in terms requiring that “the properties of the observer be left out of any descriptions of his observations” (von Foerster, 2003c, p. 293). He goes on to criticize the articulation of moral codes as making claims that, without an independent perspective, cannot ultimately be justified, and so as forms of moralization where we are concerned with what others should do at the expense of addressing our own responsibilities. Von Foerster suggests that we avoid articulating ethics to others and, instead, keep our ethical consideration implicit in our actions, putting ethics into practice rather than words.

While von Foerster’s suggestions are a rich source for ethical reflection (and well worth exploring in more depth than the brief summary I have given here), there are situations where it is difficult to see how such a stance can be maintained. There are times when ethics needs to be made explicit: where not doing so would lead to acquiescence rather than responsibility, where our responsibility includes responsibility for others and so cannot be confined to the personal, or where our actions articulate ethics whichever way we compose our language. To take designing a building as an example, we cannot in the end keep ethics implicit because architecture itself is an articulation of a way of living (e.g. Chan, 2015; Harries, 1987, 1997; Sweeting, 2016b). Indeed, intervening in the lives of others is the very point of the discipline: One would not want an architecture that was not a significant intervention in the world, creating new possibilities in some way. In design and similar situations, we cannot avoid making ethical ideas explicit; nor can we isolate our own responsibilities from those of others. Even to take an approach of enabling different possibilities, for instance, through the design of flexible or customizable spaces, is to take a specific position with concrete consequences for how others are to live. In the context of design and other similarly complex social situations, von Foerster’s position can therefore seem idealistic. Yet, the example of design can help extend as well as challenge von Foerster’s position, as I discuss in the next section.

Implicit Ethical Questioning

Designers’ approach to wicked problems can be understood as a way of coping not just with their complexity but also the ethical challenge that their asymmetry presents. Understood in terms of cybernetics, conversation coincides with, and can even be said to require, ethical considerations, without which the interaction on which it is based cannot occur (Glanville, 2004b, 2005; von Foerster, 2003b, 2003c, 2003d). Likewise, with design being a form of conversation, ethical considerations are embedded in its core activities, along the lines of von Foerster’s suggestion that we keep our ethics implicit. In this interpretation, the call to keep ethics implicit applies not just to values or standards of conduct but also to the consideration and questioning of such values and standards. There are three aspects to this I stress here: (1) concern for others, (2) personal responsibility, and (3) questions regarding purpose.

Conversation depends on our concern for others. We need to listen carefully to the contributions that others make and take them and their views into account in our own (Glanville, 2001, 2004b; van Ditmar & Glanville, 2013). While we tend to think of listening primarily as a matter of how to act in an ethically good way in a conversation, it is also a core practical requirement of participating in one. Because meanings are not directly transferred in a conversation, we are responsible not just for what we say but also for how we understand what we hear. Without listening there is no interaction and so no conversation, only monologue or a group of monologues; the conversation cannot move on, and nothing new arises in it. Part of listening is trying to understand and learn from other participants, but we also learn about our own ideas, and ourselves, by trying to understand how we have been understood. We look “through the eyes of the other” (von Foerster, 1991), considering others and how they consider us.

It must be said that designers are not always great listeners. The attitude that the designer knows best, whether because of his or her subjective genius or technical expertise, still persists in how they sometimes present themselves or are treated by others. It was against this view that Rittel and Webber developed their account of wicked problems, and while it remains common to characterize designers as experts, to do so runs counter to the conversational core of design activity. Indeed, accounts of designers as experts can obscure where their expertise lies. In addition to the conversations that designers hold with themselves, such as through sketching, the conversational structure of design activity also includes the face-to-face conversations designers hold with others, such as their regular interactions with peers and colleagues, conventional consultations with various stakeholders, and more ambitious forms of participation or codesign. While participatory processes are often considered as external to design, understanding design in terms of conversation suggests that such methods are related to core aspects of how designers work and even to ways in which they work on their own. Just as in a conversation we look through the eyes of others, so too designers use drawings to “walk through” their proposals from the point of view of those for whom they are designing, many of whom, such as the future users of a building or its passers-by, they will not be able to meet, let alone consult. In this way, even designers’ dialogue with themselves, such as through drawing, can be understood as an ethical and participatory activity, involving care for others, as well as an epistemological or practical one.¹² Mirroring this, the conversations that designers hold with other stakeholders are not solely attempts to involve others in what will affect them but also part of how designers learn about the situation in which they act. Therefore, while participation with others is often viewed as an addition to design, it can also be understood as part of designers’ own explorations, analogous to the conversations they hold with themselves via drawing. This is not to say that designers are always successful in incorporating others or always try to do this. There are many other dynamics in design

¹²While the conventions of architectural drawing can be rightly criticized in this context for their abstraction (e.g. Till, 2009), this is something addressable through the redesign of these conventions, the media in which they are presented and the way they are used.

that run counter to this, such as the enduring myths of designers as geniuses or experts or the tension between the conversational process of designing and the linearity of procurement and construction. Yet, that core aspects of how designers work are conversational in structure means that we can think of ethical concern for others as integral to design activity rather than leading to limitations on it.

In addition to listening, it is an equally important aspect of conversation that we contribute actively in what we say. We cannot participate in conversations objectively or passively if they are to be conversational because the turning of a conversation is driven by the differences between the contributions of the participants. If we are too passive, for instance, by only affirming what is said by others or doing no more than responding directly to what we are asked, then a conversation either doesn't go anywhere or descends into what is effectively a monologue, or pair of monologues, where though we may still be responding we are no longer interacting. Conversations have no predetermined script. Where there is a script, and to the extent that there is, it is no longer a conversation. There are always different paths that we can take because how we respond to what others say is not determined by what they have said. Indeed, because meanings are not transferred, we are responsible not just for how we respond but for how we understand what we respond to. If we are to sustain conversations or similarly interactive processes, we need to contribute to them in ways for which the responsibility is ours, and we cannot excuse our actions as having been determined by external pressures (Glanville, 1995, 2004b; von Foerster, 2003c).¹³

Similarly, designers cannot work passively or objectively with wicked problems as there are no right answers to be deduced, no overall goals to be optimized, and the criteria against which proposals are to be measured are known only in part at the outset. While designers are sometimes presented or present themselves as impartial or technocratic arbiters between different stakeholders, to treat wicked problems objectively is either to get nowhere or to work with some criteria rather than others in a way that is distorting or arbitrary. Where designers act passively, in rigidly following the demands of a brief rather than putting them in question, this gives nothing to those that they design for, just as staying silent in a conversation does not help it to flourish. This is reflected in Denys Lasdun's (1965, p. 185) oft-quoted summary of the role of the architect as "to give the client, on time and on cost, *not* what he wants, but what he never dreamed he wanted and when he gets it, he recognizes it as something he wanted all the time." It is not enough to fulfil the brief because it will contain ambiguities, inconsistencies, and opportunities that are only brought to light in the design process. Indeed, Negroponte has characterized the design process as, in part, the procurement of the information missing in the brief (Negroponte, 1970, p. 119; Negroponte, 1975, p. 34). Where designers are working in a truly exploratory manner, Lasdun's statement should apply *to them* as much as to their clients.

¹³Although Glanville (2004b) does not place responsibility under conversation, his discussion of it in terms of other cybernetic processes is compatible with conversation.

This does not mean that design questions are to be resolved arbitrarily or subjectively. As discussed above, design questions are full of complexly interacting criteria, constraints, and contingencies as well as responsibilities towards others. Yet, these are not fully established at the outset, and designers need to actively seek out and establish even the most rigid of constraints. As Rittel and Webber (1973, p. 161) note, “it becomes morally objectionable for the planner to treat a wicked problem as though it were a tame one, or to tame a wicked problem prematurely, or to refuse to recognize the inherent wickedness of social problems.” Given that wicked problems are defined by attempts to resolve them, designers are ultimately responsible for how they understand and characterize the extent of their own responsibility. Their action formulates what they treat as within their scope and what as outside; which constraints and criteria they challenge and which they accept; and the stance they take towards the more explicit ethical questions involved. This questioning of responsibility will often be explicit in the reframing of questions, but is also implicitly embodied in the conversational form that design activity takes, whether in terms of sketching or face-to-face dialogue with others. Through this, designers actively reformulate the situation and their understanding of it, working out where their responsibility lies. Indeed, while Lasdun’s remarks quoted above are sometimes interpreted as a claim to expertise, in the same article, he goes on to stress the importance of interacting with others, noting that the “worst work our office has ever produced” is the “competition work where there is a programme which is half-baked and there is no exchange of ideas” (Lasdun, 1965, p. 195).

Speaking and listening complement each other, enabling conversation to turn around between the perspectives of different participants. The resulting circularity allows a purpose to be pursued, such as communicating a message or reaching an agreement on future action. Purposeful activity such as this is a central concern of cybernetics, especially so in its early development (Stewart, 2000), and this is reflected in the name of the field, which Norbert Wiener (1961) derived from the Greek word for steering. This aligns closely with design, which is purposeful in seeking to achieve change in the world, and also with ethics, in terms of the pursuit of the good. The proto-cybernetic paper written by Wiener, Arturo Rosenblueth, and Julian Bigelow defined purpose in terms of action directed towards a goal, understood as “a final condition in which the behaving object reaches a definite correlation in time or in space with respect to another object or event” (Rosenblueth, Wiener, & Bigelow, 1943, p. 18). This is an adequate characterization for many examples. Yet, as Richard Taylor (1950) responded, this conception of purpose as striving towards a definite final condition does not account for vague or unsuccessful activities that are still goal-directed although no goal exists, such as “a man groping about in the dark for matches which are not there, but which he erroneously believes to be near at hand” or how “the alchemist can seek the philosopher’s stone, the knight can seek the Holy Grail” (p. 329). To these examples can be added both conversation and design, whose goals tend to shift and change as they are pursued. Indeed, Taylor’s comments anticipate a richer conception of purpose as would develop in cybernetics, which Andrew Pickering (2010, p. 18) characterized as a concern for forms of “forward-looking search.”

One way to understand open-ended purposeful activities, such as design and conversation, is in terms of the relation between their internal and external goals. In the eponymous cybernetic example of steering, rather than understanding the destination we are steering towards as the goal, defining our action in terms of something external to it, we can equally understand the purpose of steering as staying on a steady course in response to changes in the environment—and of learning how to improve at this—and so as internal to our action (Sweeting, 2015b). This is not to say that if the goals of an action are internal, it will not also involve external goals, or we must choose between these two sorts of goals. Indeed it is the pursuit of the internal goal of being on course that allows the external goal of the port (and of alternative destinations) to be pursued, while it is the journey to the port that gives the internal goal of steering its relevance and context. While activities such as design or steering a ship are concerned with external goals in effecting change in the world or reaching a destination, these can only be pursued via their internal goals. Maintaining a steady course allows the steersman to respond to changes in the environment and also to change direction to head to different ports. The ends at which design aims cannot be fully defined in advance because new understandings and possibilities, and with them new criteria, are created during the design process as the situation is explored. By sustaining the conversational processes through which the project is framed and given direction, designers question their current goals and develop new ones, allowing them to achieve ends that were not conceivable at the outset. Where design is understood only in terms of the pursuit of a given external goal, what is special about it as a response to wicked problems is lost.

In consequentialism, an ethically good action is one that maximizes its good consequences according to some fixed external goal. In addition to the various difficulties of this in practice, especially with wicked problems as discussed above, it follows that any means could be justified if it achieves the greatest good overall, opening it up to criticisms such as those of G.E.M. Anscombe (1958). By contrast, in the *Nicomachean Ethics*, Aristotle understands the ultimate human goal as that of *eudaemonia* (I.7), usually translated as “the good life” or “human flourishing,” something intrinsic to and inseparable from the very action of living. Pursuing such a goal develops new understanding and possibilities, reformulating external goals in the process. MacIntyre (1985, p. 219) defines the good life as a form of “quest”: “the good life for man is the life spent in seeking for the good life for man.” This aligns closely with the conversational way in which designers cope with wicked problems, addressing not just how to achieve their goals but also implicitly questioning what those goals are and what they could be.

We may disagree with the specific ways that designers interpret their responsibility, consider others, or question their goals. Designers do not always respond to these or other ethical issues effectively, nor is design practice always ethically good, as is clear from the troubled legacy of much architecture that has been put forward in heroically ethical terms, as well as from the contestability of design decisions discussed above. Yet, design and ethics are deeply intertwined. There is a need for designers to consider others, take personal responsibility, and pursue internal purposes for both designerly and ethical reasons. These considerations are latent in

design activity, even, and perhaps especially, when designers are not explicitly addressing ethical issues, and so design ethics need not be understood in terms of external limitations or competing priorities. Moreover, design suggests ways that we might cope with ethically complex situations in other contexts. While von Foerster's suggestion that we keep our ethics implicit can appear idealistic, it is significant that designers achieve this, at least in part, in what are complex and often highly charged circumstances. In situations where debate over the right course of action is unresolvable or counterproductive, we might therefore follow design's example in looking to implicit forms of ethical questioning. It is striking that the two most common forms of normative ethical theory—consequentialism and deontology—exclude the sort of implicit ethical consideration that I have noted to be present in design. In following predefined rules or optimizing against set goals, one cannot take the views of others into account, take personal responsibility for one's action, or question the purposes at which one aims. In having adopted such approaches, one's course of action is already set. This accounts in part, I suggest, for what MacIntyre (1985, p. 8) has observed to be the "shrill tone" of modern ethical debate, something which is in desperate need of reform.

Conclusion

In this essay I have put forward a way of understanding design and ethics in mutual terms. I have drawn on systemic approaches to design and ethics in order to build this connection and used the history of the relation between systems thinking and design as a pattern to follow. By identifying similarities of structure between ethical dilemmas and the wicked problems that designers face as a matter of course, I have argued that design can contribute to ethics as well as vice versa. Developing one aspect of this, I have identified ethical considerations that are implicit within core aspects of design activity. These enable designers to cope not just with the complexities of wicked problems but also with the ethical challenges that follow from their asymmetry.

This has a number of consequences for how we might approach ethical questions in design and elsewhere. The relationship between design and ethics need not be seen, as is often the case, in terms of trade-offs between the two or as the application of theories with which to correct design practice. Where design discourse has sought to inform itself by importing theories from elsewhere, this has often had the effect of obscuring or distorting what is special about design activity in the first place (Glanville, 2004a, 2014a). If this is to be avoided in design's encounters with ethical theory, the ethical qualities already implicit in design have an important role to play in mediating between the two. Moreover, that designers integrate ethical considerations implicitly into their thinking, and do so in even complex and ethically charged circumstances, provides an example for how we might cope with the ethical demands of other complex situations, including some of the ethical dilemmas that arise within ethical discourse itself.

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