Original Article

Principlism and citizen science: the possibilities and limitations of principlism for guiding responsible citizen science conduct

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Abstract

Citizen science (CS) has been presented as a novel form of research relevant for social concerns and global challenges. CS transforms the roles of participants to being actively involved at various stages of research processes, CS projects are dynamic, and pluralism arises when many non-professional researchers take an active involvement in research. Some argue that these elements all make existing research ethical principles and regulations ill-suited for guiding responsible CS conduct. However, while many have sought to highlight such challenges from CS, few have discussed principles per se providing the foundation for regulations. In this article we will investigate the possibilities of midlevel principlism in guiding responsible CS conduct. Principlism has the potential of accommodating many of the concerns taken to reduce the relevance of existing principles.

Keywords

Citizen science, principlism, research ethics, casuistry, mid-level principles

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Introduction

Generally speaking, *citizen science* (CS) is a form of research that includes, and depends on, the active involvement of volunteer citizens or members of the public. This involvement may be because the research requires that volunteers actively contribute material, such as observations by amateur ornithologists. It can also be because studies require manual processing of data from sources that "professional" researchers simply do not have time or resources to categorize and analyze themselves. Examples include projects like GalaxyZoo, where volunteers are invited to categorize galaxies from pictures obtained from telescope images of distant galaxies (https://www.zooniverse.org/projects/zookeeper/galaxy-zoo/). CS also includes research projects initiated by volunteers themselves in order to fill gaps in existing knowledge, often focusing on community concerns. Volunteer contributions do not merely consist of collecting data. They may also include formulation of hypotheses and analyses and discussion of data. This active involvement means that volunteers "interact with researchers as equals in the research process" (Tauginienè et al., 2021: 398). CS is often distinguished from what is described as "traditional" forms of research which have more hierarchical structures (Elliott, 2019; Rasmussen, 2019a, 2021; Wiggins and Wilbanks, 2019).

The field of CS is terminologically complex. There is neither consensus about what to call the field itself, nor the people who are engaged in it (Eitzel et al., 2017; Haklay et al., 2021). In this paper, by "CS researcher" we mean a professional researcher, typically an academic working in a university or similar institution, who has chosen CS as a research method. By "CS participant," we mean a person who volunteers in such a project and may contribute data and engage in analyses of data or formulation of hypotheses.

Use of CS is growing. It is increasingly used in health research (Wiggins and Wilbanks, 2019) and is deemed central to achieving the Sustainable Development Goals (Fraisl et al., 2020). The growth of CS might require consideration of many ethical issues for which existing regulation and research ethics guidelines are imperfectly matched. One reason is that such guidelines, to a large extent, are based on a clear distinction between professional researchers, on the one hand, and others, who are frequently regarded as ""passive" research subjects" (Tauginienè et al., 2021: 398) on the other. The relationships between (professional) researchers and others are often understood and regulated in a way that is based on, or at least consistent with, *principlism.* Principlism is an approach in applied ethics, where moral decision making, and by extension regulation, is guided by a number of ethical principles. The most well-known application of principlism is the biomedical ethics approach advanced by Beauchamp and Childress (2019). Even though principlism was initially formulated for biomedical ethics, it has been adopted in other areas as well (Sandin, 2009).

Beauchamp and Childress advocate the application of four *prima facie* principles:

1. Respect for autonomy
2. Nonmaleficence
3. Beneficence
4. Justice

These principles are not directly action-guiding (as moral *rules* aim to be). Neither do they provide ultimate justification for the moral evaluation of an action (as moral *theories* do). Instead, the principles operate at a "mid level," between theories and rules, and are non-rigid (as opposed to categorical principles), *prima facie* principles. The four principles are supposedly supported by "common morality" (Beauchamp, 2010: 155). Beauchamp and Childress (2019) argue that "all persons *committed to morality* accept the standards in the common morality" (p. 5, italics in original). This is a strong statement, and it might (reasonably) be doubted whether it is true. However, we do accept the weaker statement that the four principles are compatible with a variety of moral outlooks.

The distinction between professional researchers and research subjects is blurred in CS. This, and related concerns, have prompted some to argue that the "mainstream" principlist approach is inadequate as an ethical framework for CS. For example, Rasmussen (2019a) argues that we are forced to "reconsider the conceptual and regulatory categories with which we approach ethics in human subject research," and that "gaps in our current regulatory system" are revealed by CS (ip. 19). Some suggest that CS challenges not only existing regulation, but the very "categories of thought on which those regulations depend" (Rasmussen, 2019a: 20). Most notably, CS challenges the distinction between researcher and participants, and blurs the "neat dividing line [. . .] between research that requires ethical guidance or oversight and research that does not" (Rasmussen, 2019a: 20). Much attention has been devoted to this "ethics gap" between current regulatory frameworks and CS practices (Rasmussen, 2019a, 2019b, 2021; Resnik, 2019a; Resnik, 2019b; Resnik et al., 2015; Tauginienè et al., 2021; Wiggins and Wilbanks, 2019).

In this article we attempt to establish a defense for the application of principlism in CS. First, we survey some different forms of CS. Then we describe a number of challenges associated with the application of principlism in CS and explicate those challenges. Following that, we focus on principles and how they are understood in principlism. The section also considers some prior challenges to principlism to draw an analogy with the criticism of applying principles in CS. Finally, we consider some objections to our account, before a summary.

Citizen science

Different forms of citizen science

While CS takes a kaleidoscope of forms (Elliott, 2019), and no definition captures all forms of CS (Haklay et al., 2021), the term commonly refers to instances where:

- volunteers (often a large number) are actively involved in the research process, and
- the research project is heavily reliant upon these volunteer contributions.

The volunteer involvement takes many different forms, which is evident in the distinction between "democratized," and "contributory" CS (Cooper and Lewenstein, 2016). *Democratized* CS (Irwin, 1995) refers to democratic and participatory science that addresses the needs and concerns of citizens, as well as producing reliable knowledge developed by citizens. *Contributory* CS (Bonney, 1996) describes "projects where nonscientists contributed scientific data" (Cooper and Lewenstein, 2016: 53). Bonney's conception of CS fits a more conventional approach of volunteers contributing observations and data to large repositories.

Wiggins and Wilbanks (2019) distinguish three different modes of CS:

N-of-1 consists of self-tracking and uploading data on platforms. Examples include health self-tracking apps where users can upload data and follow their own progress.

N-of-We is community-driven and may begin in an observational mode and move to be more interventional and activist.

N-of-Many-1s is an emerging form of CS that standardizes data from N-of-1 for studies using more conventional methods. In contrast to N-of-We, this form is not community-driven but standardizes and aggregates data, where the CS participant (for instance, an app user) has an experience of a N-of-1 though the data are ultimately aggregated.

These distinctions are not clear-cut. Some contributory CS projects have online discussion forums, enabling increased volunteer participation. Some forms of CS resemble conventional research methodologies, but data accumulation substantially relies on volunteer contributions. While use of CS is now widespread, it is unclear what regulations are suitable for governance of responsible CS conduct, and this lack of clarity is made more complex by the many different forms CS can take.

Three problems for principlism in CS

For analytical purposes, we might recognize three major objections to the use of general research ethics principles in CS research ethics:

1. CS is too different from other research forms with respect to the *active participation of volunteers* (CS participants) for mainstream research ethics principles to be applicable.
2. CS requires recognition and inclusion of *plural perspectives* in a way that mainstream research ethics principles fail to accommodate.
3. CS is too *dynamic* for mainstream research ethics principles to be applicable.

We take these to be three core concerns about the inadequacy of principles for guiding CS research. Principles risk either being too broad so that they encompass "such contributions as snapping a photo of wildlife and uploading it to a public database," while simultaneously being too narrow as they are "silent about a host of other ethical issues that arise in citizen science research" (Rasmussen, 2019b: 2) like "repurposing social media and wellness platforms" (Wiggins and Wilbanks, 2019: 11).

Regarding the first objection above, CS entails more active involvement of participants in research processes relative to most other forms of research. The active involvement of CS participants blurs the distinction between professional researchers and research participants. CS participants are co-creators of knowledge, and their contributions are necessary for realizing the objectives of CS projects, but the persons involved do not reach the threshold of being classified as professional researchers. The result is that CS participants are neither professional researchers nor are they simply research participants. Whereas the rights of research participants are quite clearly defined in conventional forms of research, this is not the case for CS participants. Should CS participants be considered on par with professional researchers, collegial obligations would hold. Should they be considered research participants, standard research ethics principles and governance measures would apply. Since they do not fall readily into either category, and CS blurs the distinction between professional researcher and research participants, existing ethics governance measures may be difficult to apply because they generally assume a distinction between these two groups.

With increased diversity in research processes comes a plurality of perspectives, the second objection on the list. CS participants may have motivations and values that differ from those of (professional) CS researchers, such as being "more concerned with whether the research empowers the participants and leads to direct action," or how research results will be disseminated (Rasmussen, 2019a: 20). Existing considerations "do not necessarily reflect the concerns of participants"

(Wiggins and Wilbanks, 2019: 10) regarding data ownership, access, and acknowledgment. Wiggins and Wilbanks (2019) note that these concerns are far from uniform, giving rise to a pluralism of views. They argue that more pluralistic approaches are required to avoid a mismatch between current ethical regimes and the fundamentals of CS (Wiggins and Wilbanks, 2019: 11). For instance, regulations based on the Belmont Report (as in the U.S.), support collegial relationships rather than "researcher-subject interactions, which incur responsibilities for clearly communicating research progress and results, and faithfully completing the planned work" (Wiggins and Wilbanks, 2019: 10). CS participants do not feature in standard research ethics protocols. Thus, the obligations of CS researchers needs to be expanded when compared with those stipulated by conventional research-ethics guidelines to account for different stakeholder views and concerns.

The third objection concerns the dynamic character of CS. Tauginienè et al. (2021) highlight the dynamic character of CS projects, partly emanating from the vast amounts of data collected, aggregated, and repurposed, and also the different ways of participating which may change over time in the same project. Since the range of possible outcomes and uses of data evolves during the project, new models of consent may be needed. Conventionally, informed consent refers to "regularly informing participants about the purpose of research, the risks and benefits of being involved, and the right of a citizen to withdraw from the research at any time" (Tauginienè et al., 2021: 406). This assumes a certain predictability of research processes, such as what data will be collected and how, and what it will be used for. Conventional ways of securing informed consent—typically using an information sheet and consent form—are not ideally suited to a situation of continuous interdependence between CS researchers and CS participants. In contrast, they argue, dynamic informed consent requires "continuity in relationship maintenance and high levels of interaction through multiple contacts and ongoing communication" (Tauginienè et al., 2021: 408). Ongoing interaction promotes ongoing respect for the autonomy of citizens and allows for greater influence over how their data can be used (Tauginienè et al., 2021: 409). While not being a challenge to principles *per se* (dynamic informed consent seeks to preserve autonomy), this reveals the need for processes to be adjusted to the new conditions posed by CS. It should also be noted that this problem is not unique to citizen science. Researchers using participatory observation methods, action research and similar approaches have pointed out similar limitations of one-off versions of informed consent (see e.g. Smythe and Murray, 2000; Øye et al., 2016).

To summarize these problems: CS consists of active contributions by volunteers (CS particpants) who are neither researchers nor research participants in the conventional sense; CS requires recognition of a pluralism of viewpoints; and is it dynamic. If principles are to be relevant for guiding and regulating CS, they must be able to address these challenges.

Principles at work

Before suggesting how principles can be suitably applied for responsible CS conduct, we return to how principles are conceptualized in principlism and what work they are intended to do.

Since the four principles of principlism are operating at a mid level between theories and rules, they are not directly action-guiding. Rather, principlism provides action guidance through a dual process of *specification* and *balancing*. Specification is defined as "a process of reducing the indeterminacy of abstract norms and generating rules with action-guiding content" (Beauchamp and Childress, 2019: 17). Balancing involves deliberation and judgment about the weights and strengths of moral norms. In this manner, the principles are not rigid rules to be mechanically deployed, but facilitate structured reasoning about responsible research conduct.

Principlism is often contrasted with *casuistry*, "the use of case comparison and analogy to reach moral conclusions" (Beauchamp and Childress, 2019: 433).[1] Whether there is an actual dichotomy between casuistry and principlism is a matter of controversy (Cudney, 2014). Here, however, we accept the conventional distinction between the two approaches. We do not argue that there are no other alternatives to, and critiques of, principlism—there are (see for instance Beauchamp and Childress, 2019, ch. 10), but there is not space to consider them all here. We are also aware that the distinction is not entirely clear.

Some critics of principlism have argued for casuistry on the grounds that casuistry allows consideration of the many different conditions of medical (or other) practices, while principles are tyrannical and block compromise (Beauchamp, 2010: 161). Casuistry concentrates "on practical decision-making in particular cases and on the implications of those cases for other cases" (Beauchamp and DeGrazia, 2004: 63), deriving moral authority from analogies with past paradigm cases rather than from principles. For example, if medical confidentiality is a concern in a case that is being evaluated, "analogous cases would be considered in which breaches of confidentiality were justified or unjustified in order to see whether such a breach is justified in this case" (Beauchamp and DeGrazia, 2004). Those analogous cases are enduring sources and examples for reflection and decision-making (Beauchamp and DeGrazia, 2004). In the context of research ethics, casuistry is partly motivated by how persons can agree on the judgments of specific cases, but differ regarding what principles they rely on (Toulmin, 1981). In this sense, judgments precede principles, and the role of principles becomes questionable. As judgments rely on identifying morally relevant features of cases, casuistry might appear better equipped to cope with pluralism.

Some of the "casuist criticism" of principles is echoed in the "CS criticism" of research ethics regulations and principles. It seems as if a rejection of principles in

CS would pave the way for a casuist approach to research ethics in CS. Since there appears to be few general principles that could guide the full CS kaleidoscope, a case-based approach may be a viable option for ethical analysis of CS. Like the conclusion reached by Wiggins and Wilbanks (2019) regarding CS, there is a need "not only for multiple modes of ethical engagement, but also effective strategies for determining which ones apply to a given situation" (p. 11). It is also possible to interpret Rasmussen's (2019a) suggestion that a single set of regulations is not feasible, and that "groups of collaborators will need to find their own ways of realizing their shared values" (p. 21), as pointing toward a case-based approach, rather than a principlist one.

However, we should not abandon principlism just yet. First, no matter how many cases are available or considered, a value premise is needed to reach a prescriptive conclusion (Beauchamp, 2010: 162; Beauchamp and DeGrazia, 2004: 64; Boyle, 2004: 81). Even the selection of paradigm cases is value-laden, and the cases *become* paradigm ones because of prior commitments to central values (Beauchamp, 2010: 162). Second, principlism does not preclude judgment and sensitivity to facts. As we saw, two key requirements for implementing principlism are specification and balancing. Where specification adds substantive content to the principles, balancing requires determination of the relative weight of the principles in the cases at hand. Principles are thus not "tyrannical," since balancing invites potential compromise. While the need for balancing may strengthen the view that principlism is too indeterminate, the need for specification, as an essential requirement for implementing principles, reduces that indeterminism. Ideally, principlism "keep[s] judgments *principled* without removing agent *discretion*" (Beauchamp, 2010: 155, italics in original). Third and finally, it is not clear how justification is provided in casuistry without a framework of norms, leaving "too few resources to prevent prejudiced or poorly formulated judgments and social conventions" (Beauchamp, 2010: 164). Because of its bottom-up character, casuistry has been criticized for "lack[ing] the necessary critical distance from cultural blindness, rash analogy, and tyrannical popular opinion" (Beauchamp and Childress, 2019: 438). While none of these considerations show that casuistry is untenable, they do indicate that it is not a necessarily superior alternative to principlism in research ethics.

It has been suggested that "[c]urrent conversations around data ownership, access, and acknowledgment do not necessarily reflect the concerns of participants," concerns which are not uniform (Wiggins and Wilbanks, 2019: 10). Some issues concerning access and benefit sharing require "an expansion of traditional concepts of beneficence" (Wiggins and Wilbanks, 2019: 11). It is debatable whether principles can or cannot accommodate participant concerns, even if such concerns are far from uniform. Given that the principle of beneficence is justified with appeal to reciprocity (Beauchamp and Childress, 2019: 228ff), and that the principle of

justice avoids exploitation (Beauchamp and Childress, 2019: 286), in the context of CS, inclusion and participation would most likely be advocated for reasons of justice and reciprocity. The exact form such participation will take to encompass participant concerns will likely differ between different CS projects.

Little attention has been paid to *who* is to be included in specification, but there is no specific reason for excluding CS participants, especially considering the principles of beneficence and justice. However we should note that there are often significant differences between CS participants regarding their activity levels. A few participants may make a large number of contributions, whereas a majority might make only a few (Rohden et al., 2019). It is not unreasonable that CS projects, as a part of respecting autonomy and for reasons of reciprocity, undertake different approaches to participants depending on activity levels and the type of data the CS project involves. Some very active participants may be co-creators of knowledge, formulating hypotheses, and contribute significantly to the interpretation of data; the number and the epistemic validity of their contributions meriting iterative contact with researchers.[2]

The *prima-facie* character of the mid-level principles, and the processes of specification and balancing, means that principles can meet the challenges CS poses: its active involvement of particpants, its pluralism, and its dynamic character. While practical details must be worked out, for instance regarding whether all participants' views should be equally recognized, and in what processes such recognition ought to occur, there is nothing in principlism *per se* that excludes recognition of participant concerns. In contrast, given that it would be unethical to ignore the interests and values of CS participants, principlism offers an attractive account for responsible CS conduct through respect for persons, reciprocity and justice. Moreover, a rejection of principlism in favor of casuistry must respond to the aforementioned objections regarding the fact/value divide, the role of judgment and avoiding prejudicial values, and of justification. This speaks in favor of principlism. At the very least, respect for autonomy, non-maleficence, beneficence, and justice can guide responsible research CS conduct. A strength of principlism is that it provides a starting-point which, when implemented with specification and balancing, enables practical action-guidance and a transparent rationale for decision-making.

Objections to principlism in CS

We can envisage at least four objections to our case for principlism in CS.

First, it may be objected that our defense of principlism misses the target, since our discussion primarily concerns research *ethics* principles while the criticism of existing regulatory frameworks concerns the inadequacy of *legal* principles and regulations. For instance, Rasmussen (2021) has argued that there are at least two

ways in which existing legal and regulatory frameworks are ill-suited for CS: Central concepts, such as "human participant" or "beneficence," may be inappropriate or insufficient for CS, and existing regulations may not apply to critical ethical features of CS. However, Wiggins and Wilbanks do not claim that their analyses of ethical issues in CS is limited to legal regulations, and Rasmussen suggests that as well as the regulatory categories and concepts, the underlying "categories of thought on which those regulations depend" must also be subjected to scrutiny (Rasmussen, 2019a: 19). This, we assume, includes critique of research ethics principles. Thus, we maintain that our criticism does not miss the target. Moreover, we focus on ethical categories that *sometimes*, but not *always*, provide the foundation for research ethics regulations, as applied by Institutional Review Boards (IRBs) or other relevant bodies. We believe that CS project leaders should be able to show how they have considered the four principles, and the processes of specification and balancing. Details about how the principles are "explicated and made suitable for specific tasks" (Beauchamp, 2010: 157) will likely vary between CS projects according to the forms of data that are collected, and how CS participants are involved.

Second, ethical principles may be too indeterminate to serve any practical function, especially when contrasted with legal regulations that, despite their shortcomings, have well-established jurisdictions and, ideally, well-defined concepts and procedures for assessing the validity of claims. The *prima facie* principles involve the risk that the content of the principles is "too abstract in many situations to determine the specific acts that we should and should not perform" (Beauchamp and Childress, 2019: 427). Consider the following scenario:

> *The ethically conscientious CS researcher*: A CS researcher is about to embark on a CS project, which has been approved by an IRB review. The researcher has noticed from scholarly literature that it is key that CS participants benefit from participating, but does not know how to operationalize beneficence in practice.

Many stress that CS participants ought to benefit from their contributions to CS projects (Resnik, 2019a; Resnik et al., 2015). A principlist approach would suggest that the ethically conscientious researcher should not simply try to take the concepts "off the shelf," but rather use them as starting points for specification and balancing, as suggested above. In that way, principles are not rigid but "are *explicated and made suitable* for specific tasks, often by developing policies" (Beauchamp, 2010: 157), where "'intersubjective standards' are creatively built up over time through communal agreements and decision making" (Beauchamp, 2010: 158). This implies that the principles are interpreted and implemented *in practice*, not apart from it, and their content is made relevant to the case in hand by specification and balancing. There is no reason why an ethically conscientious

CS researcher would not also include CS participant views consistent with respect for persons, justice, non-maleficence, and beneficence.

The involvement of a plurality of perspectives, even if consistent with principlism, gives rise to additional challenges:

> *Diffuse interests*: A CS project involves a great number of CS participants. The leading researcher of the project is aware of the need to consult with the participants in order to specify and balance the principles. It becomes apparent that there are different, and at times conflicting, views on what is considered non-maleficence, and how to define benefit.

It is likely that there will be different and possibly conflicting interests and values among CS participants, as participants' perspectives can be "far from uniform" (Wiggins and Wilbanks, 2019: 10). Some participants may consider possible co-authorship or acknowledgment to be desirable benefits, while others demand that anonymity be maintained. In these cases, continuous interaction with individual CS participants is a possible solution, as is the possibility of researchers initially discussing how benefits such as credit assignment are to be specified and balanced with anonymity (Resnik, 2019a). Such involvement with CS participants echoes strategies that have been proposed for avoiding harm to communities in biomedical research, as well as in other research areas, which includes consultation and community input in protocol development, information disclosure, and dissemination of research results (Weijer and Emanuel, 2000: 1142ff).

Specification raises the risk of *overspecifying*. When a principle is overspecified it leaves "insufficient room for deliberation, judgment, and balancing" (Beauchamp and Childress, 2019: 456). This is similar to the criticism of regulatory concepts as being too specific to be of relevance to CS. Yet, it should be emphasized that principles (of principlism) are not absolute or inflexible moral principles (Beauchamp and DeGrazia, 2004: 59ff). Rather, they are *prima facie* principles that are to be balanced with other concerns and applied in a manner that is relevant to the case at hand.

The third objection concerns the practical implementation of principles. In our discussion about participation and recognizing a plurality of viewpoints we suggested that principlism is compatible with recognition of CS participants' views due to the principles of beneficence and justice. But how can that be practically implemented? Consider the following scenario:

> *Data aggregation and credit*: A research group requests that CS participants contribute with data and discussion in an online platform that is moderated by the researchers. After a while, new and exciting hypotheses are being put forward by the participants, as well as new data that were not foreseen when the researchers started the project. The CS researchers see opportunities for both publishing articles based on the data and hypotheses put forward by the particpants in their discussion, and for utilizing the collected data in ways initially not anticipated by the researchers. It is expected to lead to significant breakthroughs in their research fields.

Let us assume that the research group recognizes the need for research ethical principles including specification and balancing. But how are they practically to accommodate participation of many different CS participants? Should they credit the contribution? If so, should they credit the contribution from the group, or from specific individuals?

CS projects can be dynamic and generate research results that were initially unforeseen. The "kaleidoscope" of CS, with the many different forms that volunteer contributions can make are relevant factors to such cases. The number of participants, what form of contributions they make, and possibly should be credited for, can differ extensively. How the principles should be specified in such contexts may also differ, but the principles offer valid starting points for judgments and discretion, especially in conjunction with participant concerns. Examples of such recognition and attribution can be seen in the online CS project *GalaxyZoo* in which CS participant Hanny van Arkel, a schoolteacher from the Netherlands, observed an anomaly consequently named "Hanny's Voorwerp" (Lintott et al., 2009),[3] or the EteRNA Project that continuously lists online participants as co-authors (Lee et al., 2014). Balancing is essential for decisions about recognition; recognition may conflict with imperatives to maintain confidentiality of participants when acknowledgment risks revealing the identity of participants. A strength of the principlist approach is that specification and balancing need not necessarily occur at a specific time, but can be iterative in a manner that is similar to a dynamic informed consent process. Researchers should continuously communicate with participants to assess their concerns and recognize their interests. When new data or hypotheses have emerged, this calls for a renewed specification and balancing of relevant principles, such as including credit as a part of respect for persons.

The fouth and final possible objection is that our argument assumes that the criticism of casuistry would also be relevant to CS if moving "beyond principles." In other words, that we defend the relevance of principlism to CS by appealing to shortcomings of casuistry. While the criticism of casuistry may be valid, it does not follow that principles are needed to guide responsible CS conduct. We assert that for responsible CS to move "beyond principles" or regulations would result in a form of casuistry. Wiggins and Wilbanks (2019) call for pluralistic approaches, suggesting "not only multiple modes of ethical engagement, but also effective strategies for determining which ones apply to a given situation" (p. 11). A possibility for determining which ones apply, in the absence of principlism, is through analogy with previous cases. However, as has been argued above, this does not exclude the use of principles, as there will still be a need for value premises, justification, and for reasonable starting points for further ethical analyses, discretion, and action-guidance. Based on the above, we believe that principlism offers a reasonable starting point. It might be further objected that our argument relies too

much on assumption of a dichotomy between casuistry and principlism. If that dichotomy is false, then several other alternative approaches could be possible. While we agree that much can be said about the dichotomy, it does serve as a starting point. Principlism opposes both the bottom-up approach of casuistry, but also the top-down approach of relying too robustly on theoretical principles (Beauchamp and Childress, 2019, ch. 10). We propose that the principlist approach offers flexibility, discretion, and judgment, plus a framework for decision-making that supports ethical assessment.

Conclusions

We have argued that principlism can address the CS "ethics gap". While we believe there is merit in the criticism of the mismatch between conventional research ethics guidelines and the fundamentals of CS (Wiggins and Wilbanks, 2019: 11), and a need for multiple modes of engagement to formulate shared values and ethical expectations (Rasmussen, 2019a: 21), we argue that these calls are consistent with principlism. When including processes of specification and balancing, principlism offers a powerful framework for guiding ethical CS research conduct. However, much work remains to be done in order to explicate the specification and balancing processes for CS.

Ethical approval

No ethical approval is required for this work.

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Notes

1. A standard modern statement of casuistry is Jonsen and Toulmin (1989).

2. There is a similar concern regarding Belmont-based regulations in participatory social science. One frustration for participatory action researchers concerns how IRB type regulations require a pre-planned research project that is predictable, and suggest that while principles such as the Belmont ones can certainly be applied, they should be supplemented with representation, accountability not only to ethical review boards and colleagues but also to participants, and social responsiveness to the needs and perspectives of participants, among other dimensions (Manzo and Brightbill, 2007; Shore, 2006).
3. Note, however that the anomaly is named after its discoverer's first name, and the name retains the Dutch word—both these circumstances indicate that the credit for the discovery is not given in the standard way (e.g. as "van Arkel Object" or similar).

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