Article

Rituals and Machines: A Confucian Response to Technology-Driven Moral Deskilling

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Abstract: Robots and other smart machines are increasingly interwoven into the social fabric of our society, with the area and scope of their application continuing to expand. As we become accustomed to interacting *through* and *with* robots, we also begin to *supplement* or *replace* existing human–human interactions with human–machine interactions. This article aims to discuss the impacts of the shift from human–human interactions to human–machine interactions in one facet of our self-constitution, i.e., *morality*. More specifically, it sets out to explore *whether and how the shift to human–machine interactions can affect our moral cultivation*. I shall structure the article around what Shannon Vallor calls technology-driven moral deskilling, i.e., the phenomenon of technology *negatively* affecting individual moral cultivation, and shall also attempt to offer a Confucian response to the problem. I first elaborate in detail Vallor's idea of technology-driven moral deskilling. Next, I discuss three paradigms of virtue acquisition identified by Nancy E. Snow, i.e., the "folk" paradigm, the skill-and-expertise paradigm, and the Confucian paradigm, and show how the Confucian paradigm can help us to respond to technology-driven moral deskilling. Finally, I introduce the idea of Confucian rituals (*li*) and argue for the *ritualizing of machines* as an answer to technology-driven moral deskilling.

Keywords: moral deskilling; rituals; design; moral cultivation; robot ethics; Confucianism

1. Introduction

We *ask* Amazon Alexa or Apple Siri for recommendations on music, we *request* help from chatbots, or we *play* with robotic toys. Robots and other smart machines—broadly referred to as the class of technological artifacts capable of *autonomous decision* and *action* without direct human instruction and interference—are increasingly interwoven into the social fabric of our society with the area and scope of their application continuing to expand. As we become accustomed to interacting *through* and *with* robots, we also begin to *supplement* or *replace* existing human–human interactions with human–machine interactions. The introduction of robots and smart machines into our lives can significantly alter the existing human–human interactions (and relationship), and this shift to human–machine interaction can be for better or worse. Philosophers and roboticists have already carefully scrutinized the potential social, ethical, and legal issues raised by the supplement and replacement of humans by robots and smart machines in various aspects of our lives [1], e.g., in friendship (e.g., [2]) and intimate relationship (e.g., [3]), in classroom (e.g., [4]), and at home and at work (e.g., [5]), and their aim is to examine whether the design and use of robots and smart machines are ethically permissible and/or conducive to the good life.

These analyses, of course, are essential in our decisions on whether or not to accept the (use of) robots. They are also crucial in informing us of how to design and use machines ethically. Yet, as Sherry Turkle notes in "*Alone Together*" [6], there is a related but more fundamental philosophical issue concerning the impacts of interaction with machines on our self-constitution, i.e., *how interaction with machines change who we are*? This article aims to discuss the impacts of the shift from human–

human interaction to human–machine interaction on one facet of our self-constitution, i.e., morality. More specifically, it sets out to explore whether and how the shift to human–machine interaction can affect our moral cultivation.

To illustrate this with an example, it has been suggested that people—and, in particular, children—could become *rude* as they become accustomed to voice-interactive AI digital assistants, e.g., Amazon Alexa, Apple Siri, etc. For the AI digital assistants will give people what they want regardless of their attitudes and manners, the claim is that they promote a false sense of deservedness that creeps into people's everyday social interaction, thereby making the users rude [7–9]. The discussion of voice-interactive AI digital assistants offers a compelling case for studying the potential *negative* impacts of the shift to human–machine interaction on our moral cultivation.

I shall structure the article around what Shannon Vallor calls technology-driven moral deskilling [10], i.e., the phenomenon of technology *negatively* affecting individual moral cultivation, and shall attempt to offer a Confucian response to the problem. In the next section, I first elaborate in more detail Vallor's idea of technology-driven moral deskilling. I then discuss three paradigms to virtue acquisition identified by Nancy E. Snow, i.e., the "folk" paradigm, the skill-and-expertise paradigm, and the Confucian paradigm, and show how the Confucian paradigm can help us to respond to technology-driven moral deskilling. Finally, I introduce the idea of Confucian rituals (*li*) and argue for a *ritualizing of machines* as an answer to technology-driven moral deskilling.

2. On Technology-Driven Moral Deskilling

In supplementing or replacing humans, robots and smart machines change *how we (inter)act* and *with whom we (inter)act*, e.g., people no longer ask their family or friends for recommendations but rely on their AI digital assistants, they request help not from technicians but from chatbots, and they do not play with neighbors but with robotic or AI partners. By relegating and eliminating the needs of humans in interaction and relationships, robots and smart machines can *transform* and *disrupt* many of the existing human practices that are primarily human-based and human-oriented, e.g., kinship and friendship, help-seeking, and play. In light of the transformation and disruption brought by new technology, Vallor argues that "moral skills appears just as vulnerable to disruption or devaluation by technology-driven shifts in human practices… because moral skills are typically acquired in specific practices which, under the right conditions and with sufficient opportunity for repetition, foster the cultivation of practical wisdom and moral habituation that jointly constitute genuine virtue" [10] (p. 109). She points out that as human practices are being transformed or disrupted, they may not afford individuals the same chance to acquire moral skills and virtues because the *new* practices may not provide the right conditions or sufficient opportunity to practice. Accordingly, robots and smart machines may lead to the diminishing of moral skills, and thus the problem of technology-driven moral deskilling.

Vallor's argument rests on the skill model of virtue (see [11–14]), in which the acquisition of virtues is structurally similar to the acquisition of practical skills.[1] From this perspective, it is essential for individuals to *practice* their moral skills and *receive appropriate feedback* to become morally skillful, which, in turn, enable them to achieve the relevant virtues. In other words, if the technology offers fewer opportunities for individuals to exercise their moral skills, or if the technology does not enable them to receive appropriate feedback, then users of this technology risk being morally deskilled.

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[1]　Stichter [14] distinguishes three forms of the skill model of virtue, i.e., the weak, moderate, and strong forms. The weak form holds that virtues and skills are connected but they are not to be understood as a type of skill; the moderate form holds that there are structural similarities between virtues and skills without maintaining virtues are skills; and, the strong form argues that virtues are a type of skill. Vallor's argument for technology-driven moral deskilling is based on a strong form of skill model of virtue, but a moderate form is sufficient to establish her claim. In this article, therefore, I shall refer to the moderate form, which is less controversial.

One of the examples Vallor uses to concretize the case of technology-driven moral deskilling is 'robot caregivers' [10] (pp. 119–121).[2] She points out that caring, understood as active provision of support to people who are in need, is a type of skill. For example, for nurses and caregivers to care *well*, both knowledge and know-how of caring are necessary. When nurses and caretakers do not have suitable knowledge, they will not know *what* to do to help their patients, and thereby fail to care; but, even if they know *what* to do, they still have to know *how* to do it in a way that is comforting and/or satisfactory to their patients. Moreover, their proficiency of care know-how can only be accumulated through experience with their patients [15]. Following Vallor, as we accept caring involves a set of moral skills, such as conversation, body contact and empathizing with patients, the implementation of robot caregivers could lead to moral deskilling: When robot caregivers become as effective and/or welcoming as human caregivers, they may devalue human care and make care know-how obsolete. More importantly, the implementation of robot caregivers may reduce and remove the need of human care, which, at the same time, reduces and removes the opportunity for humans to exercise care and acquire the relevant virtues. Yet, despite the possibility of moral deskilling, Vallor remains positive towards robot caregivers to the extent that they can be designed and deployed *narrowly* to relieve human caregivers from specific tasks that are physically and mentally overburdening, which allows the human caregivers to focus on performing care activities, and thus retaining the experience of caring for patients and learning the moral skills in and virtues of care through their experience.

Here, Vallor's argument for moral deskilling from robot caregivers can be easily generalized into other domains of human–machine interaction insofar as they too devalue some human values and virtues and make the skills for achieving those values and virtues obsolete. In response to the problem of technology-driven moral deskilling, Vallor posits the opportunity to acquire moral skills as a *normative* boundary for design and deployment of technology, i.e., technology design and use *ought* not to interfere with people's acquisition of moral skills and relatedly the acquisition of virtues. While I agree with Vallor on the importance of the opportunity to acquire moral skills and virtues in designing and using technology, I believe her account of moral skill and virtue acquisition is underexplored. In particular, there are various accounts of moral skill and virtue acquisition suggesting different *criteria* and *mechanisms* for the acquisition of moral skills and virtues, and the differences in criteria and mechanisms imply different responses to technology-driven moral deskilling. A satisfactory response to the problem, therefore, has to spell out the criteria and mechanisms for the acquisition of moral skills and virtues.

3. Three Paradigms of Virtue Acquisition

In a recent analysis of the role of habits in virtue acquisition, Nancy E. Snow [16] identifies three paradigms for the acquisition of virtues, they are (i) the "folk" paradigm, (ii) the skill-and-expertise paradigm, and (iii) the Confucian paradigm. The three paradigms specify different ways in which individuals may acquire virtue through habituation, and they are helpful for illustrating various ways technology can affect our moral cultivation in transforming and disrupting our habits. More importantly, the three paradigms imply different solutions to the problem of technology-driven moral deskilling by proposing different criteria and mechanisms for virtue acquisition. Here, I describe the three paradigms and discuss their answer to moral deskilling; in particular, I examine whether they can account for the more *radical* changes in the existing human practices, including individuals' habits, brought by new technology like robots and smart machines.

2　　Vallor [10] also offers autonomous weapons systems (AWSs) and multitasking in social media as examples of technology-driven moral deskilling, where she rightly notes that "the conduct of killing in war demands considerable moral skill if it is not to descend into utter moral chaos" (p. 114) and "knowing when to pay attention [to specific tasks] is … critical to cultivating a virtuous character" (p. 116). Here, I shall focus on the case of 'robot caregivers' as it best exemplifies the issue of *replacement* of humans by robots and smart machines.

3.1. The "Folk" Paradigm

In the "folk" paradigm, virtues are acquired indirectly as a by-product of the individuals' persistent fulfillment of their roles and/or attainment of their goals. The "folk" paradigm states that "people aspire to virtue-relevant goals… [, i.e., the] goals associated with roles or activities the successful performance of which requires virtue…. Successful performance in these roles or attainment of these goals requires virtues" [16] (p. 138). For example, as Snow describes, to be a *good* teacher, one must be *conscientious* about class preparation, they should *care* about their students, and be *fair* and *even-handed* in grading, etc. When individuals learn to become good teachers, they perform actions that express conscientiousness, care, fairness, and even-handedness *repeatedly*, as the virtuous actions are *required* by and *characteristic* of being good teachers. In fulfilling one's roles or pursuing their goals, individuals may reference *explicit instruction*, emulate *role models*, or follow *received wisdom*. Snow points out that the individuals do *not* need to consciously aim for or be aware of the acquisition of virtues.

The "folk" paradigm, however, will be severely challenged by technology-driven moral deskilling. It should be reminded that moral deskilling is caused by the transformation and disruption of existing human practices and that they can call into question the value of and the need for the virtue-relevant roles and goals, and, at the same time, defeat the reason and motivation for pursuing the virtuous actions. In a scenario where robot caregivers are more efficient and welcoming than human caregivers, *good* human caregivers become unnecessary and redundant. In such a scenario, people have no reason or motivation to strive to become good caregivers, and thus have no reason or motivation to perform the virtuous actions of good caregivers. More generally, when human–human interaction is replaced by a more effective and welcoming form of human–machine interaction, individuals will have no reason or motivation to maintain the human–human interaction.

The difficulty for the "folk" paradigm is that individuals' persistent performance of virtuous actions is contingent on the pursuit of their virtue-relevant roles and goals. Accordingly, there is no intrinsic reason or motivation for them to exercise the virtuous actions once technology renders the roles and goals unnecessary and redundant. Here, the proponents of the "folk" paradigm may defend their paradigm by arguing for the intrinsic value of the virtue-relevant roles and goals, e.g., to argue the role of human caregivers is in itself intrinsically valuable. While this strategy may be plausible, if technology *really* outperforms humans and is considered more favorably by human users, arguing for the intrinsic value of the roles and goals, and thus rejecting the technology, appears to be *luddite* and *ad hoc*. More importantly, it is the loss of moral skills and virtues but not the loss of the roles and goals *per se* we want to avoid in responding to technology-driven moral deskilling.[3] Focusing on virtue-relevant roles and goals, the "folk" paradigm cannot account for technology-driven moral deskilling.

3.2. The Skill-and-Expertise Paradigm

The skill-and-expertise paradigm states that "[v]irtuous dispositions, like practical skills, are acquired and cultivated through habituation that is intelligent and flexible, not mindless routine" [16] (p. 144). Unlike the "folk" paradigm, it requires individuals' *conscious* and *deliberative* efforts to acquire moral skills and virtues. Like the acquisition of *practical* skills, crucial to the skill-and-expertise paradigm are individuals' "the need to learn" and "the drive to aspire" and their ability to explain their acts as virtuous.[4] Compare novice chess players to expert chess players: The experts

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[3] This is, I think, why Vallor offers a separate argument for the importance of (moral) skills.

[4] Snow's analysis of the skill and expertise paradigm follows Julia Annas' account of virtue [11,12], but other plausible accounts of the skill and expertise paradigm have been proposed, e.g., [13,17]. Annas' account differs in its emphasis on the *intelligibility* of moral skills and virtues, i.e., the acquisition of moral skills and virtues is a *rational* process and the articulation requirement. It is helpful to point out that Vallor also emphasizes the intelligibility of moral skills and virtues in her discussion of technology-driven moral deskilling. Accordingly, we can view the skill and expertise paradigm as the account of moral skill and virtue acquisition preferred by Vallor.

distinguish themselves for their knowledge of chess as well as their aspiration to become better. Moreover, the experts should be able to explain to the novices what they are doing and why they are doing it. Analogously, virtuous individuals, such as a *caring* nurse, must have the relevant knowledge of care and an aspiration to be good at care, and they must be able to explain to inexperience nurses what they count as care and why. The skill-and-expertise paradigm, therefore, stresses the role of individuals in the acquisition of moral skills and virtues, as individuals themselves must consciously and deliberatively cultivate *their* virtues, which they understand and can explain to others. Yet, the skill-and-expertise paradigm also acknowledges the significance of context, as individuals live their own, unique lives, and the different contexts individuals are in will call for different sets of moral skills and virtues and different ways to practice and realize them.

This paradigm is useful in illuminating the problem of technology-driven moral deskilling. A *radical* change in the existing human practices does affect the opportunity for individuals to exercise moral skills and perform virtuous acts, and the relevant virtue concepts may even be given up by people if smart machines eventually replace them. It also suitably accounts for the *normative* dimension of technology-driven moral deskilling, as exercising moral skills and performing virtuous acts are essential to virtue acquisition, and virtues are something one ought to aim for. So construed, the badness of technology-driven moral deskilling is due to its hindrance on people's moral flourishing, which cannot be compensated by the effectiveness of or the pleasure from robots and smart machines. Given the skill-and-expertise paradigm's emphasis on conscious and deliberative efforts to cultivate virtues, it will answer the problem of moral deskilling by designing or deploying technology in ways that maintain or restore individuals' opportunity to practice moral skills and virtuous acts.

Decisions on technology design and use are certainly integral to answering moral deskilling, but the skill-and-expertise paradigm's emphasis on *individuals'* conscious and deliberative efforts in moral skill and virtue acquisition, thereby rendering the problem *an individual problem*, is questionable. For this paradigm, it is the individuals' responsibility to *choose* which technology to use and how to use it to avoid moral deskilling. Unfortunately, this response risks over-blaming individuals by viewing moral deskilling as the result of their faulty or irresponsible choices, which, in turn, assumes an indefensible *hyper-rational and autonomous understanding of person* who can always best decide for themselves and to do so freely. The same is true when viewing the problem of moral deskilling primarily as an issue of technology design, as it falsely assumes designers to have relatively unrestricted power and control to (re)shape human practices and neglects the weight of social, political, and cultural consideration [18,19].

3.3. The Confucian Paradigm

Finally, the Confucian paradigm considers "virtue cultivation as structured immersion into a way of life, characterized by a set of values, such as the key virtues of benevolence (*ren*) and righteousness (*yi*), ritual practices that express them, scrupulous attention to detail and demeanor, and a focus on correctness in externalities" [16] (p. 149). This paradigm utilizes (social) environments proactively to shape individuals' attitudes and behaviors. There is an emphasis in the Confucian paradigm on individuals' *external* and *expressive* behaviors, i.e., their performance of behaviors and expression of attitudes ought to accord with a specific normative standard, i.e., rituals, and individuals ought to cultivate their moral skills and virtues by aligning their behaviors and attitudes to that normative standard. In short, the Confucian paradigm assumes a strong correlation between (external) behaviors and (inner) virtues [20,21].

I shall return to the normative standard in the Confucian paradigm. However, I should already point out that the reference to rituals distinguishes the Confucian paradigm from the skill-and-expertise paradigm in that the normative standard is explicitly *intersubjective* and *relational*: Individuals are to be judged by their behaviors and attitudes, which are publicly displayed, in accordance to a normative standard shared by their community and in their tradition. So construed, whether individuals are virtuous or not can only be determined *by* and *with others*. Relatedly, technology-driven moral deskilling cannot be construed merely as an individual problem, as the

social, political, and cultural background for the acquisition of moral skills and virtues are taken seriously in the Confucian paradigm. Here, the Confucian paradigm's attention to rituals as a normative standard, I believe, offers a different response to technology-driven moral deskilling. However, to fully elucidate a Confucian response to technology-driven moral deskilling, a brief discussion of the idea of rituals in Confucian philosophy, i.e., Confucian *li*, is in order.

4. Cultivating Virtues Through Confucian *Li*

The idea of rituals (*li*) is a key tenet in Confucian ethics, and it has been suggested that the reference to *li* as a normative standard is what distinguishes Confucian ethics from other ethical traditions [22–25]. In Confucianism, *li* refers to social convention, etiquette, and other patterns of courteous behaviors and includes norms for formal occasions, e.g., receiving guests in "*The Analects*" *10.3* [26] (p. 99), and mundane activities, e.g., a person's clothing and posture in "*The Analects*" 10.6 [26] (pp. 100–102). Moreover, Confucian *li* prescribes appropriate behaviors and emotional responses to individuals with reference to their role(s) and relationship(s) with others in specific (social) circumstances.

Confucian *li* is central to Confucian ethics because of the special significance of familial relationships and social roles in Confucian ethics. More specifically, Confucianism assumes that individuals' relationships and roles are *constitutive* of their personhood, i.e., whether individuals are truly and fully a person depend on their proper fulfilling of relationships and roles; and, to fulfill one's relationships and roles properly is to enact one's responsibility prescribed by their relationships and roles.[5] Here, successful fulfillment of one's relationship and role responsibility is not defined arbitrarily but guided by Confucian *li*. Moreover, Confucian *li* provides *thick* instruction, not just *thin* principles, for what behaviors and attitudes are considered to be appropriate in various contexts. Compare, for example, Confucian *li* with deontological principles, e.g., one ought to care for elderly people owing to the respect for their autonomy and integrity, and consequentialist principles, e.g., one ought to care for elderly people for the positive outcomes from the acts of caring, Confucian *li* not only demands caring for elderly people *simpliciter* but it requires individuals to care for them *in specific ways* as informed by the rituals of care in a community and tradition. In other words, people's relational and role responsibility are inscribed in Confucian *li*, which serves as the source of normativity in Confucianism.[6] Of course, Confucian ethics does not demand unreflective and rigid ritual performance, as it leaves no room for (moral) agency and amendment in Confucian *li*, thereby rendering it to absurdity. In fact, since Confucian *li* depends on people's relationships and roles with the interacting partners and the (social) circumstances, personalization and improvisation of Confucian *li* are required for any successful ritual performance [29].

The thick instruction in Confucian *li* is not merely a normative standard of (moral) right and wrong, but it is intended to serve as the guidelines for individual and societal flourishing. Hence, Confucian *li* has a *formative* function, which is best characterized by Xunzi's discussion of Confucian *li*,

> "Ritual ['*li*'] cuts off what is too long and extends what is too short. It subtracts from what is excessive and adds to what is insufficient. It achieves proper form for love and respect,

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[5]   I, therefore, adhere to the role ethics interpretation in Confucian ethics. The role ethics interpretation, however, is not uncontroversial; in particular, the role ethics interpretation competes with the virtue ethics interpretation of Confucian ethics, which prioritizes Confucian virtues. It is not my aim to settle the debate between the role ethics interpretation and virtue ethics interpretation in this paper, but it should suffice to point out that *li* acts as a normative source in both role ethics interpretation and virtue ethics interpretation. For an overview of role ethics interpretation of Confucianism and its differences from other interpretation. See [27,28].

[6]   Of course, it is not the case that *all* relationships and roles are equal in Confucianism. Confucian ethics prioritizes familial relationships and roles and affirms the virtues of filial piety and fraternity (*xiaodi*).

and it brings to perfection the beauty of carrying out *yi* ['righteousness']" in *Xunzi*, Chapter 19 [30] (p. 209).

According to Xunzi, Confucian *li* is essential in taming our excessive desires and heightening our ethical feelings. It achieves this formative function by specifying the appropriateness of behaviors and emotional responses for various social circumstances. When individuals practice and perform Confucian *li*, they become accustomed to the appropriate behaviors and emotional responses, which, in turn, dispose them to act *virtuously* [23–25,31].[7]

The bodily-performative dimension of Confucian *li* is crucial for its formative function as well. Confucian *li* is a set of *thick* instructions for a variety of interactions and (social) circumstances; therefore, it must describe *how* Confucian *li* is to be executed to avoid being vacuous.[8] Moreover, the bodily-performative dimension of Confucian *li* allows individuals to internalize norms and values *reflexively*, which then enables them to (re)act effortlessly and spontaneously, i.e., *wuwei*, in different contexts [32]. The capacity to (re)act in the *wuwei* way is essential to Confucian ethics, as it conceives our everyday ethical encounters as most often pre-reflective and influenced by situations, and thus, an ethics that merely focuses on reflection and/or deliberate actions is insufficient insofar as it cannot account for the pre-reflective and situational influences [25,33,34]. Finally, Michael Puett [35] also argues that Confucian *li* creates an "as if" space, in which people can train and refine their ethical dispositions. In other words, the bodily-performative dimension is essential because individuals could acquire physiological and emotional experiences and learn to modulate them through (re-)enactment of the critical events in the "as if" space of Confucian *li*.[9]

More generally, David Solomon [37], in arguing for the moral significance of rituals, observes that (i) rituals increase the repertoire of human actions by meaning-*making* and meaning-*giving*, e.g., humans could not *hit home runs* unless they are able to participate in the ritualized game of baseball that defines *what home runs are*; and, (ii) rituals facilitate the performance of socially important actions by specifying and clarifying the rules for them, e.g., *appropriately* greeting someone becomes difficult if an understanding of the rituals of greeting is missing; finally, (iii) rituals serve to inculcate moral attitudes in people and help them to acquire virtues by instructing individuals about the appropriate behaviors and attitudes embodied in rituals.

The Confucian paradigm agrees with Solomon's analysis, i.e., individuals should reference Confucian *li* for the meaning of human actions and the actions' appropriateness in specific contexts, and they should act through Confucian *li* to appropriately (re)shape their emotional and physical experiences, which help them to cultivate virtues. The Confucian paradigm shifts our attention away from the acquisition of moral skills and virtues by individuals to the social, political, and cultural background by which individuals and societies flourish. Indeed, as Mark Coeckelbergh [18] rightly points out, in technologically mediated activities, it is not entirely up to the individuals to control the forms of activity and the consequences of the activities to themselves because of various social, political, and cultural factors that underline the technologically mediated activities. Moral skill and virtue acquisition, therefore, is not merely an *individual matter* but, in an important sense, a *shared and collective endeavor*.

5. Ritualizing Machines: A Response to Moral Deskilling

So far, I have described the Confucian paradigm of moral skill and virtue acquisition and the normative role of Confucian *li* in this paradigm. The Confucian paradigm and its attention to rituals offer a different picture of technology-driven moral deskilling. Instead of viewing it as a problem that

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[7]　See [24] on Olberding's discussion of Xunzi's defense of ritual mourning in the working of Confucian *li*.

[8]　A comparison with the acquisition of (bodily) skills will be useful. For example, consider learning how to play tennis: It is not sufficient to only learn the rules of the game and the techniques and strategies available, but one must also learn how to execute those techniques and strategies. Moreover, tennis players improve their game by honing and refining *the ways* they play, i.e., their gesture, strokes, etc. Also, see [23] for Stalnaker's comparison of ritual with music and cooking.

[9]　See [36] for a detailed analysis of the idea of Confucian *li* and the roles it can play in philosophy of technology.

arises from faulty or irresponsible choices of technology design and use by designers and users, the Confucian paradigm views the problem as an indication of a *disfunction* of Confucian *li* caused by new technology, which occurs when technology transforms or disrupts human practices in ways that prompt individuals and the society to neglect the rituals in their community and tradition.

Recall Vallor's case of robot caregivers: Robot caregivers are morally questionable when they reduce and remove the opportunity for individuals to exercise care and acquire the relevant virtues through care practice. Her response to the problem is to remind of the importance of *not* designing and implementing care robots in ways that *replace* human beings in tasks of *care* and *related virtues* and only in ways that *complement* them in performing these tasks. Similarly, the Confucian paradigm requires us to limit the design and implementation of care robots in ways that do not supersede the roles and responsibilities of human beings in *caring*. According to the Confucian paradigm, however, the problem with technology-driven moral deskilling is not simply an individual problem as per Vallor's suggestion, i.e., that individuals lack opportunities to exercise moral skills and acquire virtues, which, of course, is also recognized by the Confucian paradigm, robot caregivers become morally problematic when they drive us to ignore the rituals of care in one's community and tradition, i.e., the performance of specific behaviors and expression of specific attitudes of care in the care environment. Since rituals give human actions meaning and make them meaningful to us, the loss of the rituals of care entails the loss of meaning of care as well. So construed, the problem of technology-driven moral deskilling is a much broader shared and collective matter.

In response to technology-driven moral deskilling, the Confucian paradigm can argue for the establishment of Confucian *li* as the normative standard for technology design and use. Here, a recent proposal of Confucian robot ethics from JeeLoo Liu [38] is instructive.[10] Liu derives three moral rules for robot ethics from three Confucian virtues: Firstly, based on the virtue of loyalty (*zhong*) to one's role, she asserts that (CR1) robots must first and foremost fulfill their assigned role; secondly, based on the virtue of reciprocity (*shu*), she argues that (CR2) robots should not act in ways that would afflict the highest displeasure or the lowest preference onto other human beings, when other options are available; and, finally, based on the virtue of humanity (*ren*), she claims that (CR3) robots must render assistance to human beings in their pursuit of moral improvement, unless doing so would violate (CR1) and (CR2), and they must also refuse assistance to human beings when their projects would bring out their evil qualities or produce immorality.

While Liu formulates the three moral rules in terms of Confucian *virtues*, Confucian *li* can be readily incorporated into (CR1) and (CR3) and then be used as an answer to the problem of moral deskilling. For instance, Confucian *li* can specify and clarify the role(s) robots *should* be assigned in (CR1) and so, to avoid overstepping the relational and role responsibility, ought to be fulfilled by humans. Relatedly, Confucian *li* describes one means for individuals to achieve moral improvement, and thus to concretize the idea of moral improvement and moral degradation in (CR3). Using the case of robot caregivers as an illustration, (CR1) and (CR3) together should avoid the problem of technology-driven moral deskilling by preventing robot caregivers from overtaking the relational and role responsibility that is central in the rituals of care, i.e., (CR1), and by ensuring robot caregivers only facilitate the performance of the rituals of care, i.e., (CR3).

Now, one may object that the Confucian response to technology-driven moral deskilling does not differ from Vallor's proposal of positing the opportunity to acquire moral skills as a *normative* boundary for design and deployment of technology, as the Confucian response too suggests *designing* and *using* technology in ways that do not interfere with performance of Confucian *li*, which, in turn, includes performance of moral skills.

It is indeed true that the Confucian response also takes into consideration people's opportunity to acquire moral skills because exercising one's moral skills is part and parcel of proper ritual performance. By attending to rituals, however, the Confucian response introduces a more holistic view of the problem of technology-driven moral deskilling and turns the focus from technology's impacts on individuals' values and virtues to its impacts on human practices. Notably, the Confucian

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[10] Liu's article is translated and published in Chinese, but an unpublished version is available online. The discussion in this section is based on the original English version.

response views the problem as stemming from technology's transformative and disruptive impacts on the *nature* of human activities, including the manner in which the activities are carried out, e.g., how and why, when robot caregivers are implemented, some behaviors and attitudes are no longer deemed as valuable and meaningful *in* the care practice. In this respect, the Confucian response requires going beyond maintaining the opportunity to exercise moral skills and affirms the value and meaningfulness of moral skills *qua* part of rituals.[11] In short, the Confucian response looks to (re)shape technologically mediated activities through the existing rituals (cf. [39]). Moreover, as Confucian *li* serves as a normative guidance in rethinking the technologically mediated activities, designers and users are required to consider the social, political, and cultural factors related to the activities, as these factors inform them what rituals are relevant and how the rituals ought to be enacted. The attention to rituals, therefore, helps dispel the indefensible hyper-rational and autonomous understanding of person.

Furthermore, the Confucian response foregrounds the bodily-performative dimension in technologically mediated activities, as Confucian *li* aims to cultivate individuals' effortless and spontaneous reactions to everyday ethical encounters by refining and modulating their emotional and physical experience. Accordingly, in rethinking the technologically mediated activities, the bodily influences of technology, in particular the possibility of structuring bodily movements through technology design and use [40,41], and the affective influences from different technologies [42] will be explicitly considered in the Confucian response.

In fact, the Confucian response may even warrant *proactively* shaping individuals' bodily and emotional states in accordance with Confucian *li* in technologically mediated activities, i.e., (CR3). Kristina Niedderer [43,44] has recently advanced the idea of "mindful design" and explored the possibility of raising users' attentiveness to the relational, social, and environmental consequences of their actions through the design of objects. One of the examples she mentions is to design mobile phones to "shout back" at their users should they talk too loudly in public. Here, the design is intended to alert the users to the disrupting impacts they have on others around them and lead them to adjust the level of their voice [44]. "Mindful design" converges with the Confucian response in their concerns over people's inattentiveness to social convention, etiquette, and other patterns of courteous behaviors and the resulting behaviors and attitudes. Hence, one can imagine that the Confucian response advocates designing technology that enables individuals to be more attentive to the rituals in various circumstances. In other words, the Confucian response shall defend a *ritualization* of technology to facilitate individual and societal flourishing.[12]

6. Conclusion

This article examines the problem of technology-driven moral deskilling, i.e., the phenomenon of technology negatively affecting individual moral cultivation. In this article, I have clarified the phenomenon and the potential responses to the problem by illustrating the different criteria and mechanisms for the acquisition of moral skills and virtues. Particularly, I argue that the "folk" paradigm cannot sufficiently answer the problem as it assumes an instrumental stance towards moral skills, and that the skill-and-expertise paradigm, while it helpfully explains the phenomenon, seems to be based on an individualistic understanding of person that is indefensible. Accordingly, I turn to the Confucian paradigm and suggest that its attention to rituals—or, more precisely, Confucian *li*— can offer a different answer to the problem of moral deskilling. More specifically, by referencing Confucian *li*, the Confucian response argues against the displacement of humans and the replacement of human activities with machines by defending the value and meaningfulness of human practices through rituals. It also introduces the social, political, and cultural background into consideration for

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[11]　The Confucian response's defense of the significance of (moral) skills, therefore, differs from Vallor's in that the Confucian response is inherently *social* and *collective* and Vallor's response is individualistic. More specifically, the Confucian response considers moral skills *qua* part of rituals as constitutive of our moral and social reality, whereas Vallor focuses on moral skills as intrinsically valuable to human agency.

[12]　There is, of course, the risk of paternalism with the Confucian ritualization of technology. This problem is discussed in detail in [36,45].

the (re)shaping of technologically mediated activities. Finally, it stresses the proactive role technology could play through becoming part of the rituals, i.e., the ritualization of technology.

Nonetheless, it may be argued that the Confucian response's deference to rituals is ultimately futile. Given the transformations and disruptions caused by new technology are *radical*, rituals in a community and tradition may not be able to provide timely and adequate responses due to their *conservative* nature. There is, of course, the possibility of a *dysfunction* of rituals, i.e., the rituals in the community and tradition become *inapplicable* because of the radical changes introduced by new technology. The dysfunction of rituals is a serious challenge to the Confucian response, which I am unable to address in this article. However, I shall point to two preliminary answers to the critique. Firstly, while rituals are conservative, rituals can be, and have been, updated by individuals and the society. In this respect, the critique is real only if new technology leads to a radical discontinuity of the present from the tradition. Secondly, and relatedly, if there is a radical discontinuity, one can expect the radical changes challenge not only the rituals but other normative standards as well. So construed, this critique does not uniquely apply to the Confucian response, but to other normative foundations too. Certainly, the two answers are far from satisfactory, but they provide a future direction necessary for the Confucian response to moral deskilling and more generally a Confucian approach to robot ethics.

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