

2021

Trust Development in Artificial Intelligence-based Emerging Technologies: Rise of Technomoral Virtues and Data Ethics

Adil Bilal

University of Canterbury, adil.bilal@pg.canterbury.ac.nz

Stephen Wingreen

University of Canterbury, stephen.wingreen@canterbury.ac.nz

Ravishankar Sharma

Zayed University, ravishankar.sharma@zu.ac.ae

Pouyan Jahanbin

University of Canterbury, pouyan.jahanbin@pg.canterbury.ac.nz

Follow this and additional works at: <https://aisel.aisnet.org/acis2021>

Recommended Citation

Bilal, Adil; Wingreen, Stephen; Sharma, Ravishankar; and Jahanbin, Pouyan, "Trust Development in Artificial Intelligence-based Emerging Technologies: Rise of Technomoral Virtues and Data Ethics" (2021). *ACIS 2021 Proceedings*. 52.

<https://aisel.aisnet.org/acis2021/52>

This material is brought to you by the Australasian (ACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ACIS 2021 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Trust development in Artificial Intelligence-based Emerging Technologies: Rise of Technomoral Virtues and Data Ethics

Research-in-progress

Adil Bilal

Department of Accounting and Information Systems
University of Canterbury
Christchurch, New Zealand
Email: adil.bilal@pg.canterbury.ac.nz

Stephen Wingreen

Department of Accounting and Information Systems
University of Canterbury
Christchurch, New Zealand
Email: stephen.wingreen@canterbury.ac.nz

Ravishankar Sharma

College of Technological Innovation
Zayed University
Abu Dhabi, United Arab Emirates
Email: Ravishankar.Sharma@zu.ac.ae

Pouyan Jahanbin

Department of Accounting and Information Systems
University of Canterbury
Christchurch, New Zealand
Email: pouyan.jahanbin@pg.canterbury.ac.nz

Abstract

Ethical usage of artificial intelligence and data science is a rapidly evolving topic of discussion among individuals, organizations, and society. More attention has been paid to moral rules and regulations during such discussions than these stakeholders' moral character development. This study examines how individuals deploy their moral decision-making skills under conditions of uncertainty. What are the most important or most unimportant virtues in their decision to develop trust in artificial intelligence-based emerging technologies in the presence of personal information privacy threats? Using Q-methodology, the Concourse theory, and virtue ethics, four viewpoints (i.e., virtues-based decision-making structures) of individuals are extracted from a group of 39 participants for developing trust in emerging technologies. The findings of this study are of interest to philosophers, ethicists, and other stakeholders who work in the areas of moral decision-making under uncertainty, artificial intelligence, and data ethics.

Keywords Technomoral virtues, AI ethics, Data ethics, virtue ethics, Concourse theory

1 Introduction

Emerging technologies (ETs) using artificial intelligence (AI) and connected to the internet of things (IoTs) devices will soon change the global working landscape. We see a massive investment in AI and data science sectors by industries to improve productivity, optimize business efficiency, foster innovation, and provide high-quality services to consumers. It is worth mentioning that where these AI-based ETs and data science will help individuals and society, they have also raised concerns of privacy, trust, awareness, surveillance, coercion, reputation, and data quality. The reasons behind these concerns include the vast amounts of data collection by these technologies – with or without individuals’ consent – and then the application of machine learning using powerful algorithms to predict individuals’ technology usage and other behaviors. Moreover, these technologies are challenging legal boundaries. In addition to these issues, there is a conflict of interests among the stakeholders involved in these ETs and data science (individuals, organizations, and society) (Someh et al. 2019). These issues and conflicts have opened a new Pandora’s box among these stakeholders about “ethical usage of data” (also known as “Data Ethics”).

Floridi & Taddeo (2016) define data ethics as “a new branch of ethics that studies and evaluates moral problems related to data (including generation, recording, curation, processing, dissemination, sharing and use), algorithms (including artificial intelligence, artificial agents, machine learning and robots) and corresponding practices (including responsible innovation, programming, hacking and professional codes), in order to formulate and support morally good solutions (e.g., right conducts or right values) (p. 1).” It has been argued that there are five ethical principles of AI and data usage (i.e., transparency, justice and fairness, non-maleficence, responsibility, and privacy) around which global convergence is emerging (Jobin et al. 2019). In the meantime, there is a substantive divergence among the stakeholders’ viewpoints over these principles’ interpretation, importance, and implementation. Additionally, in the majority of these discussions, all the involved stakeholders have not been consulted. Additionally, more attention has been paid to moral rules and regulations instead of the stakeholders’ moral character development, worsening the situation.

Ethical discussions typically happen around ethical theories (e.g., Virtue Theory, Kantianism, utilitarianism). Virtue Theory helps us to understand our general ethical duties to others based on our character (i.e., virtues, practical wisdom), while Kantianism (i.e., follow the universal principles) and utilitarianism (i.e., follow the maximum happiness principle) help us to understand our general ethical duties to others based on our actions. Vallor (2016) argues that during this crucial time, where ETs are becoming more complex and unpredictable, virtue ethics can help us learn how to live well with them. Virtue ethics is the one that offers the solution for morally based decision-making under conditions of uncertainty. This research-in-progress focuses on how the different stakeholders involved in AI and data ethics accomplish moral decision-making under conditions of uncertainty. How are their thinking styles similar or different from each other? Which of the stakeholders needs more attention in moral character development as compared to others? This research-in-progress has applied Concourse theory and Q-methodology to understand this subjective phenomenon and find the answers to these questions. In this paper, we will report our first findings of this research-in-progress, related to one of the stakeholder groups – individuals. Our research question was: how will individuals develop trust in ETs? What virtues are most important or most unimportant to decide to buy and use ETs?

The remainder of this paper is organized as follows. The Literature Review section elaborates on the topics of virtue ethics and what is meant by technomoral virtues. The research methodology section explains how perfectly Concourse theory offers us the opportunity to understand virtue ethics, Q methodology, and how this study data are collected and analyzed. The following section, Results, explains the findings of this study. The paper concludes with the importance of virtue ethics in the current time, upcoming results of this research-in-progress, and future recommendations.

2 Literature Review

2.1 Virtue ethics and trust in emerging technologies

The prominent moral philosophy related to character ethics is virtue ethics or Aristotelianism, founded by Aristotle (384 – 322 BCE). Virtue ethics focuses on moral character development rather than duties, rules, or the consequences of actions to decide what is right or wrong. Accordingly, action will only be considered morally good if the actor is a virtuous person. A virtuous person has certain habits (i.e., virtues) and moral intelligence (i.e., practical wisdom) (Morris 1998; Vallor 2016). A virtuous person applies moral intelligence during decision-making to ensure that “habits are not producing acts that violate the moral sense of the situation” (Vallor 2016). Aristotle identified several virtues that a virtuous

person must have (courage, temperance, liberality, magnificence, pride, good temper, friendliness, truthfulness, wittiness, and justice) (Morris 1998). There are several other modern lists of virtues, larger in numbers, which have been extracted from the work of Aristotle and other virtue ethicists, and which can be found in studies like Solomon (1992), Morris (1998), Shanahan & Hyman (2003), Hackett & Wang (2012), and Vallor (2016).

A good decision is not an outcome of rules. Followers of Utilitarianism and Kantianism argue that we need many rules to live well and to make good decisions about the problems we face daily, which we argue is impossible. Virtue ethicists counter that we cannot make rules for every single current problem and upcoming unknown problems. Decision-making is a subjective phenomenon that varies from individual to individual, time to time, and culture to culture. We must remember that rules need moral interpretations from somewhere beyond the realm of rules, from wisdom and virtue. For example, during a challenging time, an individual relies “on both the wisdom to see what ought to be done and the virtue required for doing it” (Morris 1998). Wisdom helps individuals perceive what is right by guiding from the realm of experience, while virtue is a “stable trait that allows its possessor to excel in fulfilling its distinctive function” or an ethical character tendency (Morris 1998; Vallor 2016). To become virtuous and for moral functioning, an individual is dependent on the cultivation of the moral self (Stets & Carter 2011). The moral self can be regarded as the individual’s self-identity (Jennings et al. 2015), which plays a crucial role in moral judgments and moral actions (Stets & Carter 2011). Unfortunately, today we do not have enough opportunities to cultivate our moral self (Vallor 2016). Moreover, over time, we lack opportunities to cultivate our moral self due to the reliance on technologies and their rapid adoption by society in everyday life.

During the last two centuries, our society has been trained to use rational decision-making calculus (e.g., moral principles) instead of using their values, habits, emotions, feelings, and affections (e.g., moral self). It is evident in earlier research that individuals use rational decision-making calculus to develop trust in technologies. As the outcome of that calculus, individuals find technologies more beneficial and like to use them while knowing that these technologies pose severe threats to their personal information privacy (PIP) (Culnan & Armstrong 1999; Hoehle et al. 2018). Because of this decision-making fallibility, organizations are trying to deploy more and more new technologies in the markets and collect more and more personal data of individuals. This increased data collection aims to predict societal behavior using the latest data analytics tools in the name of improved productivity, optimized business efficiency, innovation, and high-quality services to consumers.

What is needed at this time is to focus on the decision-making fallibility of individuals and find the solution by introducing the viewpoints of all the involved stakeholders. All the efforts to date that we have put together to design AI and data ethics are fruitful. We believe that these efforts could be more fruitful if we study decision-making behavior under conditions of uncertainty of all the involved stakeholders (i.e., technologies’ developers, producers, managers, users, all involved in data generation, recording, curation, processing, dissemination, sharing and use, technology regulators, relevant government bodies, philosophers, and ethicists) from a virtue ethics perspective. It will also help us to understand how individuals will develop trust in AI-based ETs in the presence of PIP threats and other uncertainties. Vallor (2016) has noted that “the cultural diversity of virtue traditions, when combined with their overarching commitments to moral self-cultivation, habitual practice, discerning judgment, and flourishing relationships, offers strong prospects for a pluralistic ethical discourse about living well with emerging technologies (p. 55).”

2.1.1 Technomoral virtues

Technologies are an essential part of contemporary life, whose effects on society are, to some extent, imperceptible. AI-based ETs are about to transform our contemporary way of living. However, where these technologies are about to revolutionize every aspect of our lives, they will also pose severe threats to societal values. Everyone wants to live with ETs and reap their benefits but not at the cost of their values, freedom, and liberties. Vallor (2016) noted that “today’s technologies open their own new social and moral possibilities for action. Indeed, human technological activity has now begun to reshape the very planetary conditions that make life possible. Thus, 21st-century decisions about living well— that is, ethics— are not simply moral choices. They are ‘technomoral’ choices, for they depend on the evolving affordances of the technological systems that we rely upon to support and mediate our lives in ways and to degrees never before witnessed (p. 2).” We need to cultivate a special kind of moral character to deal with these technomoral choices and to live well with ETs. Vallor (2016) termed this cultivation of moral character as cultivation of “technomoral virtues.” She identified 12 technomoral virtues: honesty, self-control, humility, justice, courage, empathy, care, civility, flexibility, perspective, magnanimity, and technomoral wisdom. This perspective is a philosopher’s and virtue ethicist’s viewpoint. What are the

Card Number	Statement	Card Number	Statement	Card Number	Statement
1	Cheerfulness	19	Thrift	37	Balance
2	Prudence	20	Kindness	38	Empathy
3	Hopefulness	21	Humility	39	Magnanimity
4	Gracefulness	22	Hospitality	40	Insightfulness
5	Benevolence	23	Helpfulness	41	Thoughtfulness
6	Enthusiasm	24	Sensitivity	42	Love
7	Civility	25	Politeness	43	Decency
8	Boldness	26	Humor	44	Resourcefulness
9	Loyalty	27	Reasonableness	45	Harmony
10	Resiliency	28	Liveliness	46	Dignity
11	Trustworthiness	29	Sincerity	47	Cooperativeness
12	Honesty	30	Creativity	48	Persistence
13	Altruism	31	Self-discipline	49	Faithfulness
14	Amiability	32	Reliability	50	Openness
15	Steadfastness	33	Tolerance	51	Cool-
16	Commitment	34	Modesty		Headedness
17	Warmth	35	Consistency	52	Perspicacity
18	Tactfulness	36	Integrity		

Table 1. Q-statements

viewpoints of the other stakeholders involved in AI-based ETs? The primary focus of this research is to bring forward hidden structures of virtuous decision-making from the viewpoints of the other stakeholders.

3 Research Methodology

This study represents a step toward exploring ways to live well with AI-based ETs by studying the hidden structures of virtues that help us in moral decision-making under conditions of uncertainty and that exist within the stakeholders of AI-based ETs. It attempts to capture nuanced perspectives from the stakeholders individually and then synthesize them into broader themes that can help design AI and data ethics.

According to virtue ethics, wisdom helps individuals perceive what is right by guiding from the realm of experience. It means that when individuals find themselves in a decision-making situation under conditions of uncertainty (e.g., trust in AI-based ETs that pose severe threats to PIP), they interact with a set of ideas. For example, what do they need from ETs? What do they expect from ETs? What are they afraid of when using ETs? During this interaction time, they solve this dilemma based on their earlier experiences and knowledge of technologies. We believe that Concourse theory can help us understand this decision-making process. Concourse theory is a theory of communicability that helps us understand the hidden structures of the concourse on a given topic of interest. Concourse theory is not just a theory of communicability; it also provides guidelines on how to extract the information on how people interact with a set of ideas in domains of interest. Accordingly, it could be helpful in our case to understand the hidden embedded structures in the concourse of virtue ethics that individuals deploy during moral decision-making under conditions of uncertainty.

3.1 Q methodology and Concourse Theory

William Stephenson – a renowned psychologist and physicist – founded the concourse theory of communication and created the Q-methodology to study the subjectivity of science following philosophies and methods from the quantum worldview during the early 20th century (Stephenson 1953). This methodology helps us understand how a person thinks, believes, and generally behaves during a specific situation from their perspective, thus controlling personal bias.

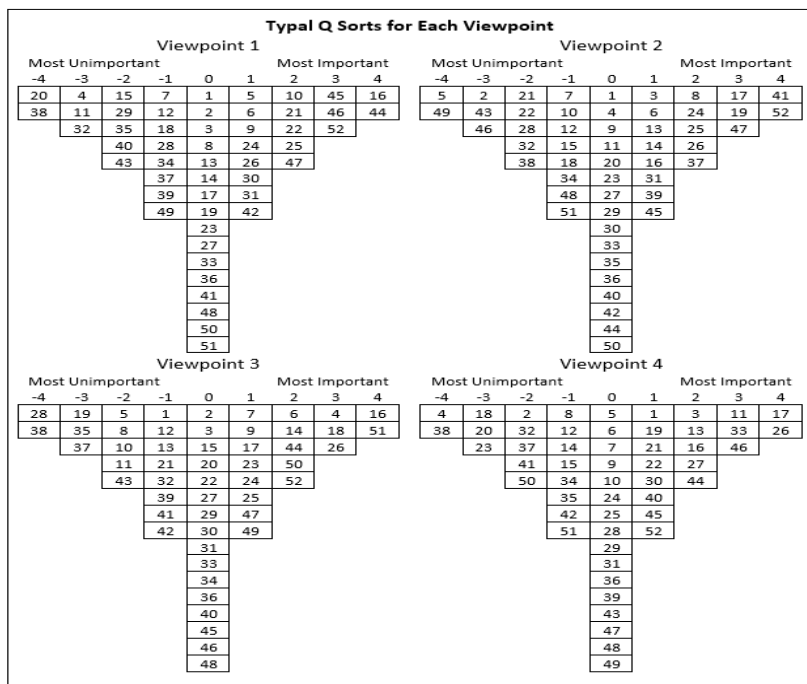


Figure 1: Typal Q Sorts for Each Viewpoint

3.2 Data source and Analysis technique

The first step in applying Q-methodology is to create a set of Q-statements that show the representative set of statements from the universe of the concourse. It is crucial to make sure the Q-statements represent the domain of interest maximumly (Brown 1980). In the case of this study, a list of virtues could be the representation of the universe of virtue ethics concourse. For this purpose, this study has adopted the modern list of virtues identified by Morris (1998). Table 1 shows the list of virtues used – a set of 52 Q-statements – in this study. These statements were printed on cards to be rank-ordered by research participants. The next step in the Q-methodology is to select the research participants. In Q-methodology, the P-sample term shows the number of people who participated in the Q-study. P-sample must include exemplar members of society that can represent various viewpoints of that society. Q-method emphasizes small numbers of participants. A theoretical consideration governs participant selection (i.e., research participants are chosen for their particular relevance to the study’s goals). Following these guidelines, this study obtained a P-sample of 39 participants over the age of 18 and have had at least one year of experience using technological devices (e.g., smartphones, smartwatches, smart tablets). The following step in Q-methodology is to get participants to Q-sort (i.e., the rank ordering of the Q-statements). Q-sorting is “a modified rank-ordering procedure in which stimuli are placed in an order that is significant from the standpoint of a person operating under specified conditions” Table 1 Q-statements (Brown 1980). The Q-sorting was completed by following a specific pattern, which comprised two steps. In the first step, the participants divided the Q-statements into three categories: agree, neutral, and disagree. In the second step, participants sorted the statements on -4 and +4 distribution anchors – most important and most unimportant – with gradations in between after comparing and contrasting. In this way, the participants shared their opinions based on their point of view and comparative judgment without affecting external factors. At the end of Q-sorting, participants were asked to take part in an interview. They were asked questions about the two lowest-ranked and two highest-ranked statements they felt were most or least important to them. This activity was added to the process to get additional insights into the problem under observation and correctly interpret the viewpoints that emerged from the subsequent data analysis. The Q-sorts were analyzed using PQMethod software v.2.35, using principal components factor analysis with varimax rotation. The guidelines provided by Brown (1993) were followed to analyze and extraction of factors from the collected Q-sorts.

4 Results

Using our selected analysis method, a total of four factors we finalized after detailed interpretation. These factors explained 51% of the variance. Out of 39 participants, the first factor alone accounts for 14 participants, the second for 8 participants, and the third and the fourth for 5 participants each. The remaining 7 participants were cross-loaded between the factors. Figure 1 shows the viewpoints of

individuals on trust in AI-based ETs in the presence of PIP threats based on the four extracted factors. These viewpoints show the “typal” Q sorts of exemplar individuals who hold these unique four viewpoints. Each typical Q sort represents a unique subjective perspective that exists among the stakeholder group of individuals.

5 Typal Subjectivities and Discussion

It is important first to note that there are some common virtues that are important and unimportant to the development of trust in AI-based ETs, which were shared across the emergent viewpoints of the individuals. Viewpoints 1 and 2 share perspicacity as an important virtue. Similarly, viewpoints 1 and 3 share commitment as an important virtue, viewpoints 2 and 4 share warmth as an important virtue, and viewpoints 3 and 4 share humor as an important virtue. On the other side, viewpoints 1, 2, and 3 share empathy as an unimportant virtue. And viewpoints 1 and 2 share kindness and gracefulness as unimportant virtues. Viewpoint 2 has shown totally different points of view on unimportant virtues compared to viewpoints 1, 3, and 4. The first subjective viewpoint that emerged was that of individuals who believe commitment, resourcefulness, perspicacity, dignity, and harmony are the most important virtues to develop trust in ETs. In contrast, empathy, kindness, reliability, trustworthiness, and gracefulness are the most unimportant virtues. This viewpoint accounts for 20% of the total variance. The second subjective viewpoint that emerged was that of individuals who believe thoughtfulness, perspicacity, warmth, thrift, and cooperativeness are the most important virtues to develop trust in ETs. In contrast, faithfulness, benevolence, dignity, prudence, and decency are the most unimportant virtues. This viewpoint accounts for 12% of the total variance. The third subjective viewpoint that emerged was that of individuals who believe cool-headedness, commitment, tactfulness, gracefulness, and humor are the most important virtues to develop trust in ETs. In contrast, empathy, liveliness, balance, consistency, and thrift are the most unimportant virtues. This viewpoint accounts for 8% of the total variance. The fourth subjective viewpoint that emerged was that of individuals who believe humor, warmth, dignity, trustworthiness, and tolerance are the most important virtues to develop trust in ETs. In contrast, empathy, gracefulness, helpfulness, tactfulness, and kindness are the most unimportant virtues. This viewpoint accounts for 11% of the total variance. In a nutshell, all participants in this study represented one group of the stakeholders of AI and data ethics (i.e., individuals). They have provided a unique and insightful subjective perspective. This study result shows four different types of viewpoints (i.e., virtues structures for moral decision-making under conditions of uncertainty) exist among individuals to develop trust, buy, and use AI-based ETs. Although viewpoints 1, 3, and 4 are closely associated with each other, but still hold a significant separate identity. In this study, the Q-methodology has helped us understand the discourse of virtue ethics in-depth and uncover hidden realities. The difference in the viewpoints indicates to us the influence of other hidden variables that should be investigated. These findings will help us understand how these variables shape individuals' beliefs and attitudes and resultantly impact individuals' virtues.

6 Conclusions

In this study, we have reported our first findings related to one key stakeholder group involved with AI-based ETs - individuals. We found that there are four diverse types of viewpoints among individuals. The first viewpoint shows that commitment, resourcefulness, perspicacity, dignity, and harmony are important virtues for developing trust in ETs. This viewpoint is held by people who believe that dedication to technology usage, performance-enhancing modern technologies' features, and status quo matter most to them in developing trust in ETs. They also believe that they have no other choice except to buy and use modern technologies. The second viewpoint shows that thoughtfulness, perspicacity, warmth, thrift, and cooperativeness are important virtues for developing trust in ETs. This viewpoint is held by people who believe that technology usage mindset, performance-enhancing modern technologies' features, technology addiction, and wise use of money matter most to develop trust in ETs. Like type 1 people, type 2 people also believe that they have no other choice except buying and using modern technologies. The third viewpoint shows that cool-headedness, commitment, tactfulness, gracefulness, and humor are important virtues for developing trust in ETs. This viewpoint is held by people who believe that dedication for technology usage, choice of the best technology, attractive features, and playfulness matter most to them when developing trust in ETs. They also are not very eager to buy and use modern technologies (e.g., they are not early adopters). The fourth viewpoint shows that humor, warmth, dignity, trustworthiness, and tolerance are important virtues for developing trust in ETs. This viewpoint comprises people who believe that playfulness and fun with technologies, technology addiction, status quo, and existing trust in technology matter most to them in developing trust in ETs. They also seem not to care about what other people believe about these technologies. When

we compare these findings with the technomoral virtues identified by Vallor (2016), the results appear to be counter-intuitive. It is premature to conclude, but this finding may explain the decision-making fallibility of individuals about their moral decision-making under conditions of uncertainty. This research-in-progress presented the findings only from one group of stakeholders - individuals - therefore, the results of this study cannot be generalized until we analyze and include the perspectives of other stakeholders.

7 References

- Brown, S. R. 1980. *Political Subjectivity: Applications of Q Methodology in Political Science*, New Haven: Yale Univ Pr.
- Brown, S. R. 1993. "A Primer on Q Methodology," *Operant Subjectivity* (16:3/4), pp. 91–138.
- Culnan, M. J., and Armstrong, P. K. 1999. "Information Privacy Concerns, Procedural Fairness, and Impersonal Trust: An Empirical Investigation," *Organization Science* (10:1), pp. 104–115.
- Floridi, L., and Taddeo, M. 2016. "What Is Data Ethics?," *Phil. Trans. R. Soc. A* (374:2083), p. 20160360. (<https://doi.org/10.1098/rsta.2016.0360>).
- Hackett, R. D., and Wang, G. 2012. "Virtues and Leadership: An Integrating Conceptual Framework Founded in Aristotelian and Confucian Perspectives on Virtues," *Management Decision* (50:5), pp. 868–899. (<https://doi.org/10.1108/00251741211227564>).
- Hoehle, H., Aloysius, J. A., Goodarzi, S., and Venkatesh, V. 2018. "A Nomological Network of Customers' Privacy Perceptions: Linking Artifact Design to Shopping Efficiency," *European Journal of Information Systems*, pp. 1–23. (<https://doi.org/10.1080/0960085X.2018.1496882>).
- Jennings, P. L., Mitchell, M. S., and Hannah, S. T. 2015. "The Moral Self: A Review and Integration of the Literature," *Journal of Organizational Behavior* (36:S1), pp. S104–S168. (<https://doi.org/10.1002/job.1919>).
- Jobin, A., Ienca, M., and Vayena, E. 2019. "The Global Landscape of AI Ethics Guidelines," *Nature Machine Intelligence* (1:9), Nature Publishing Group, pp. 389–399.
- Morris, T. 1998. *If Aristotle Ran General Motors*, (1st edition.), New York, NY: Holt Paperbacks.
- Shanahan, K. J., and Hyman, M. R. 2003. "The Development of a Virtue Ethics Scale," *Journal of Business Ethics* (42:2), Springer, pp. 197–208.
- Solomon, R. C. 1992. "Corporate Roles, Personal Virtues: An Aristotelean Approach to Business Ethics," *Business Ethics Quarterly* (2:3), pp. 317–339. (<https://doi.org/10.2307/3857536>).
- Someh, I., Davern, M., Breidbach, C. F., and Shanks, G. 2019. "Ethical Issues in Big Data Analytics: A Stakeholder Perspective," *Communications of the Association for Information Systems*, pp. 718–747. (<https://doi.org/10.17705/1CAIS.04434>).
- Stephenson, W. 1953. *The Study of Behavior; Q-Technique and Its Methodology*.
- Stephenson, W. 1982. "Q-Methodology, Interbehavioral Psychology, and Quantum Theory," *The Psychological Record* (32:2), p. 235.
- Stephenson, W. 1986. "Protoconcurus: The Concourse Theory of Communication," *Operant Subjectivity* (9:2), pp. 37–58. (<https://doi.org/10.15133/j.os.1985.002>).
- Stets, J. E., and Carter, M. J. 2011. "The Moral Self: Applying Identity Theory," *Social Psychology Quarterly* (74:2), pp. 192–215. (<https://doi.org/10.1177/0190272511407621>).
- Thomas, D. M., and Watson, R. T. 2002. "Q-Sorting and MIS Research: A Primer," *Communications of the Association for Information Systems* (8:1), pp. 141–156.
- Vallor, S. 2016. *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting*, Oxford University Press.

Copyright © 2021 authors. This is an open-access article licensed under a [Creative Commons Attribution-NonCommercial 3.0 Australia License](https://creativecommons.org/licenses/by-nc/3.0/), which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and ACIS are credited.