"As much as the potential benefits of digital technology are real, so too are the risks and complexity that ride with them."
(Yoo et al., 2012, p. 1406)

"With great digital power comes great digital responsibility."
(Recker et al., 2025; p.1222)

I. Introduction

Digital technologies give humanity unprecedented power to transform nature, society, and the conditions of human existence itself (Franssen et al., 2009; Jonas, 1984). This power is inherently ambivalent: digital technologies can generate substantial benefits, but they can also produce unintended consequences that cause serious real-world harm to individuals, organizations, and society as a whole (Chatterjee & Sarker, 2024; Yoo et al., 2012). Understanding how negative outcomes emerge and how they can be prevented, makes responsibility in socio-technical contexts one of the grand challenges of our time (Voegtlin et al., 2022). Because digital responsibility is inherently complex, multilevel, multidimensional, and socio-technical, understanding and advancing it is a central task for information systems (IS) research (Recker et al., 2025). Accordingly, IS scholars increasingly examine how digital technologies can be designed, governed, implemented, and used responsibly, that is, in ways that align with human values and societal needs (S. Brown, 2025; Mikalef et al., 2022, 2025; Pappas et al., 2023).

Becoming responsible in socio-technical contexts thus requires preventing harms associated with digital technologies and enabling beneficial outcomes for present and future generations (Heidegger, 1977; Jonas, 1984). Yet, existing IS research on responsibility remains largely fragmented and lacks a coherent account of how, where, and when it emerges, is attributed, or is displaced across the digitalization process, and of how "becoming responsible" in socio-technical contexts can be enacted.

This dissertation aims to address this gap by developing an empirically illustrated framework of continuous responsibility alignment. Building on traditional philosophical accounts of responsibility, engagement with technology ethics, existing conceptualizations of responsibility in socio-technical contexts, and the findings of the included studies, the framework provides a diagnostic account of who is responsible for what and to whom, whether responsible actors possess the agency required to fulfil their obligations, whether they recognize and retain that responsibility, whether responsibility translates into action, and whether these alignments remain intact as the socio-technical system evolves. In doing so, it seeks to diagnose the conditions under which attributed responsibility actually becomes responsible action across context, artifact, and use, and over time.

This introductory section (A.I) serves two purposes. First, it aims to motivate the research conducted within the five studies included in this dissertation, demonstrating the need to

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position responsibility as a core IS issue (A.I.1). Second, it provides a comprehensive overview of the structure and contents of this cumulative dissertation (A.I.2).

I.1 Motivation

Digital technologies have entered virtually all dimensions of human life (Hess et al., 2014; Majchrzak et al., 2016; Yoo, 2010). In fact, it is difficult to think of a domain that has not been affected by or conceived of as a potential application context for digital technologies. Our personal lives, our work contexts and society as a whole have been transformed by new means of communication and automation (Meythaler et al., 2023). We are hyperconnected, having constant access to other people, knowledge, and media (Gaines, 2019), and our surroundings are ever more robotized, with intelligent digital agents, autonomous vacuum cleaners and self-driving cars becoming increasingly pervasive (Fortunati, 2018). As more aspects of our existence unfold in digital spaces or are impacted by technological systems, we are increasingly living a "digital life" (Hess et al., 2014, p.247) and moving towards a "digital world" (Baskerville et al., 2020, p.512). Ubiquitous phrases such as *"there is probably an app for it"* reflect the extent to which digital technologies have become an unquestioned part of how we navigate our day-to-day experiences and how readily we rely on them by default (Baskerville et al., 2020).

Importantly, digitalization is not a matter of simply replacing a physical experience with a digital one. Digital technologies actively change *practices* (Da Silva et al., 2025; Ngwenyama et al., 2024; Riemer & Johnston, 2017). They influence what actions are possible, how these actions are carried out, why they are undertaken, and who is able or expected to perform them. In this way, digitalization can trigger major changes in society, industries and organizations, affecting structures and processes and how they evolve over time (Bailey et al., 2022; Markus & Rowe, 2021; Vial, 2021). These changes are visible across domains such as business, public administration, healthcare, and education, where digital innovations reorganize service delivery, roles, interactions, and institutional processes (Hess et al., 2014; Madan & Ashok, 2023; Pachidi et al., 2021; Q.-H. Wang et al., 2026). Rather than simply responding to existing physical realities, digital technologies thus actively create them (Baskerville et al., 2020, p.509). This becomes particularly consequential as organizations and public institutions increasingly rely on algorithmic systems and artificial intelligence (AI) to support or automate decisions across domains like healthcare, management, employment, insurance, or social services (Caplan et al., 2018; Jussupow et al., 2021; Kellogg et al., 2020; Marjanovic et al., 2022; Sundaresan & Guler, 2025).

The transformative (and even generative) potential of digital technologies inevitably has consequences. These consequences are, more often than not, complex in that they extend beyond the intended outcomes controlled or anticipated by the designer, implementor or user. Regularly, they include unexpected or unintended effects that emerge,

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directly or indirectly, through the design, use, or implementation of a technology (Schoormann et al., 2025) that can be both positive and negative. This duality of digitalization outcomes is well-established in IS research (Meythaler et al., 2023) and arises because digital technologies are intertwined with and affect social, organizational and individual practices (Ngwenyama et al., 2024; Riemer & Johnston, 2017). Appendix A provides a detailed synthesis of the bright/dark side of IS across individual, organizational and societal levels.

Against this background, ethicists have long warned against the assumption that technological progress will necessarily improve human life (Arendt, 1958; Franssen et al., 2009; Gehlen, 1957; Jonas, 1984; Mumford, 1934). Technological development thus creates an imperative to prevent harm and ensure positive outcomes and human dignity for current and future generations (Ciriello et al., 2026; Jonas, 1984; Leidner & Tona, 2021). With the rising recognition that digital technologies are not the panacea they are sometimes presented as, there has been increasing interest in the concept of responsibility in IS.

IS has an established scholarship on responsibility-related phenomena including privacy, fairness, security, transparency, and increasingly responsible AI (Carl & Hinz, 2024; Laine et al., 2024). Yet, much of this literature addresses responsibility indirectly through ethical principles, responsible practices, governance mechanisms, or desirable technological outcomes rather than theorizing the responsibility relation itself. Consequently, existing studies do not consistently specify who bears responsibility for what, to whom it is owed, on what basis it is attributed, and under what conditions an attributed responsibility can be enacted in practice (Trier et al., 2023; de Vaujany et al., 2025; Recker et al., 2025). Moreover, there is a lack of comprehensive frameworks examining how digital technologies enable or constrain social good (Pang et al., 2024) and studies examining questions of “for whom [are benefits generated] and at what cost.” (S. Brown, 2025, p.vi). This matters because ambiguity about who is responsible for what during digitalization can leave harms unaddressed when no actor is clearly positioned to prevent them.

Although a growing body of empirical research has begun to examine how particular forms of responsibility are enacted in practice (e.g., Durani et al., 2025; Rivera et al., 2025), explicit theorization of responsibility has often taken the form of conceptual frameworks, editorials, and agenda-setting contributions (S. Brown, 2025; Ciriello et al., 2026; De Vaujany et al., 2025; Pappas et al., 2023; Recker et al., 2025; Trier et al., 2023). Recent IS research has begun to conceptualize the nature of responsibility in socio-technical contexts, particularly focusing on who should be held accountable for emerging consequences and who bears responsibility to prevent harm in the first place. For example, Trier et al. (2023) articulate a set of normative principles for responsible digitalization across individual, organizational, and societal levels. Recker et al. (2025) map digital responsibility as a multidimensional construct comprising accountability, obligation, and dependability. Related work on corporate digital responsibility examines how organizations

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can govern and institutionalize responsibility for the consequences of digital technologies (e.g., Lobschat et al., 2021; B. Mueller, 2022). While these accounts specify important dimensions, levels, and challenges of digital responsibility, they do not provide a systematic diagnostic account of whether responsibility attributed to a particular actor is matched by the agency required to discharge it in a given socio-technical arrangement. The relationship between normative responsibility and effective capacity to act therefore remains less developed.

Other extant work highlights the complexity of determining responsibility when digital technologies become involved. Digital technologies can obscure *who* is responsible *for what*, *to whom*, and *at what point* during digitalization by undermining conditions commonly regarded as prerequisites for responsibility, such as sufficient knowledge, control, and agency, for example due to the "black box" nature of algorithms (Coeckelbergh, 2023; De Vaujany et al., 2025; Mikalef et al., 2025). Recent conceptualizations therefore move toward the dynamic question of "becoming responsible." De Vaujany et al. (2025), for example, conceptualize responsibility as constituted through sociomaterial imputation and narrative emplotment, thereby explaining how actors become positioned as responsible across extended socio-technical events. This account illuminates the constitution and attribution of responsibility but is not intended as an operational diagnostic of whether an actor to whom responsibility is imputed possesses the agency required to discharge it or whether that responsibility subsequently translates into responsible action.

Taken together, existing responsibility frameworks illuminate complementary aspects of responsibility, including *who* ought to be responsible, *what* responsibility entails, *how* it is attributed or socially constituted, and *why* it must be continually maintained as socio-technical arrangements evolve. Less developed, however, is an integrated and empirically informed diagnostic account of *whether* responsibility can actually be discharged by a particular actor in a particular socio-technical arrangement. Specifically, existing frameworks do not systematically connect the attribution of responsibility with the actor's effective agency to fulfil it, its recognition and retention by that actor, its translation into responsible action, and the continued alignment of these conditions as digitalization unfolds. Against this background, this dissertation asks: ***How can responsibility be meaningfully located and enacted across pre-deployment decisions, design, and situated use of digital technologies?***

This cumulative dissertation thus aims to explain how actors can become responsible across the digitalization process. In doing so, it responds to calls for more cumulative knowledge on (digital) responsibility in IS research and practice (De Vaujany et al., 2025; Recker et al., 2023, 2025). Specifically, it contributes theoretically-informed and empirically illustrated insights into how responsibility can be enacted during pre-deployment

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decisions, design, and use of digital technologies. These insights are grounded in philosophically and technology ethics-informed conceptualizations of responsibility in socio-technical contexts, thereby aiming to clarify who can and should become responsible, for what, to whom, and under what conditions.

Doing so, it adopts a predominantly forward-looking perspective on responsibility, recognizing that digitalization creates not only retrospective questions of blame, accountability, and liability, but also prospective obligations to anticipate, prevent, and mitigate harm (Coeckelbergh, 2020, 2023; De Vaujany et al., 2025; Jonas, 1984). Accordingly, responsibility is conceptualized in two complementary ways: first, as an operational and normative concept that can orient decisions and actions throughout the digitalization process; and second, as a dynamic socio-technical phenomenon that emerges through interactions among actors, technologies, and institutional contexts and may itself be transformed through engagement with digital technologies (Recker et al., 2025). Moreover, while actors may attribute agency and responsibility to technology, the dissertation itself does not claim that technology legitimately bears moral responsibility.

Collectively, the included studies illustrate the multifaceted nature of responsibility. Empirically, they examine responsible practices (operational/normative conceptualization) and the emergence of responsibility (socio-technical conceptualization). This dissertation's central conceptual contribution is a framework of continuous responsibility alignment, which provides diagnostic mechanisms to identify whether stakeholders can become responsible across pre-deployment conditions, design, and use of digital technologies. Distinguishing between responsibility *for*, *in*, and *through* the system, the framework conceptualizes that responsibility can only be meaningfully enacted when it is matched with the actor's actual agency to fulfill it (responsibility-agency alignment) and if they recognize themselves as responsible and act accordingly (responsibility-action alignment). A central premise is therefore that bearing responsibility does not necessarily imply being able to become responsible in practice. Actors may be assigned obligations by virtue of their role, task, or authority while lacking the agency required to discharge them. Likewise, possessing both responsibility and sufficient agency does not mean that an actor will actually become responsible in practice. By conceptualizing “becoming responsible” as reliant on responsibility alignment, this dissertation tries to bridge the gap between normative, analytical and empirical treatments of responsibility in IS research.

The included studies are conducted in the context of digital global health, that is, they are concerned with digital health interventions in low- and middle-income countries (LMICs). The specific geographic focus lies on sub-Saharan Africa. This context provides a theoretically and practically consequential setting for studying responsibility in socio-technical contexts. First, healthcare is a high-stakes domain in which technology-related errors,

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misuse, or resistance can directly affect patient safety and clinical outcomes; even seemingly minor disruptions or misjudgments may therefore result in serious harm or reduced quality of care (Lebovitz et al., 2022). This is exacerbated when focusing on *global* health. LMICs are characterized by political, economic, and infrastructural volatility (see e.g., Njihia & Merali, 2013) and high levels of structural inequality (see e.g., Ganapathy et al., 2026). These conditions make LMICs an insightful "extreme" context for studying responsibility in socio-technical contexts, because they can constrain access to digital technologies, shape who benefits from them, and amplify the negative consequences of technological failure, exclusion, misuse, or resistance (see e.g., Masiero, 2022).

I.2 Dissertation Structure

This dissertation is structured into three main parts. Part A, ***Foundations***, establishes the conceptual, theoretical, and empirical basis for the dissertation and situates the included studies within the broader IS discourse on responsibility and digitalization. After having motivated the overarching research problem, Section A.II develops the conceptual foundation through which the study findings are subsequently interpreted. It begins with classical and contemporary philosophical accounts of responsibility and relevant perspectives from technology ethics, before turning to existing conceptualizations of responsibility in socio-technical contexts and IS research. It then introduces digital global health as the empirical setting in which these responsibility questions are examined. Building on these foundations, Section A.III translates the conceptual discussion into the dissertation's research agenda by identifying the relevant research gaps, deriving the overarching research questions, positioning the included studies within broader research paradigms and the responsibility literature, and outlining the overall research design.

Part B, ***Studies on Becoming Responsible in Digital Global Health*** presents the five studies that examine how responsibility can be understood and enacted across different phases of the digitalization process in the context of digital global health. Section B.I focuses on pre-deployment decisions regarding deployment conditions, examining how digital health interventions can be targeted and planned in ways that avoid reinforcing existing inequalities by identifying underserved regions, marginalized populations, and other stakeholders whose needs may otherwise remain overlooked. Section B.II turns to responsible design, developing design knowledge for anticipating affected stakeholders, mitigating unintended consequences, and the conditions under which digital artifacts can support responsible action. Section B.III examines responsibility during technology use, focusing on how health workers position responsibility between themselves and digital decision-support technologies and how these responsibility attributions shape subsequent clinical decision-making. Taken together, the studies provide complementary insights into responsibility before deployment, during design, and in situated use, thereby contributing to a more holistic understanding of who can and should prevent harm, under

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which conditions, and at what point in the digitalization process. Importantly, Sections B.I and B.II primarily approach responsibility as a prospective and normative concept, whereas Section B.III examines responsibility as a dynamic socio-technical phenomenon that emerges, shifts, and may be displaced through interaction with digital technologies. Table 1 provides an overview of the included studies.

Table 1. Overview of the Included Studies

Part	Title	Outlet	Status	VHB[4]
B.I	***Responsible deployment conditions (research question 1)***			
B.1	Making the case for a targeted needs assessment for mHealth: prioritizing regions in sub-Saharan Africa using geospatial mapping	Hawaii International Conference on System Sciences	published	B
B.2	A computational text analysis of recent African digital health strategies and their attention to vulnerable populations	PLOS One	published	B
		Prior version: European Conference on Information Systems		A
B.II	***Responsible design (research question 2)***			
B.3	Challenges of mediated digital health access: opening up the problem space for proxy use	European Conference on Information Systems	published	A
B.4	Prevention beyond disease: designing a digital artifact for Tuberculosis screening in low-resource contexts	Target journal: EJIS (Submission planned for Q1 2027)	*manuscript*	*NA*
B.III	***Responsible use (research question 3)***			
B.5	Who decides when technology gets involved? Shifting responsibility narratives in digital Tuberculosis screening	Target journal: JAIS (Submission planned for Q1 2027)	*manuscript*	*NA*

Part C, ***Contributions***, brings together the findings from the five studies and interprets them through the conceptual foundations developed in Part A to articulate the dissertation's overarching contribution to research on responsibility in socio-technical contexts. Section C.I synthesizes the study findings across pre-deployment, design, and technology use, answers the three overarching research questions, and develops the framework of continuous responsibility alignment as the central conceptual contribution of the dissertation. In doing so, it connects the findings of the individual studies to broader philosophical, technology-ethics, and IS debates on responsibility and explains how responsibility can be located, aligned with agency, enacted, and continuously reassessed across the digitalization process. Section C.II then explicates the dissertation's theoretical, empirical, and practical contributions, discusses its limitations, and identifies avenues for

[4] The classification of the outlets for the studies included in this dissertation is based on the JOURQUAL4-ranking provided by the *Verband der Hochschullehrerinnen und Hochschullehrer für Betriebswirtschaft e.V.* (VHB), which can be found online at: https://www.vhbonline.org/services/vhb-rating-2024

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future research. Finally, Section C.III concludes the dissertation. Figure 1 depicts the overall structure of the dissertation.

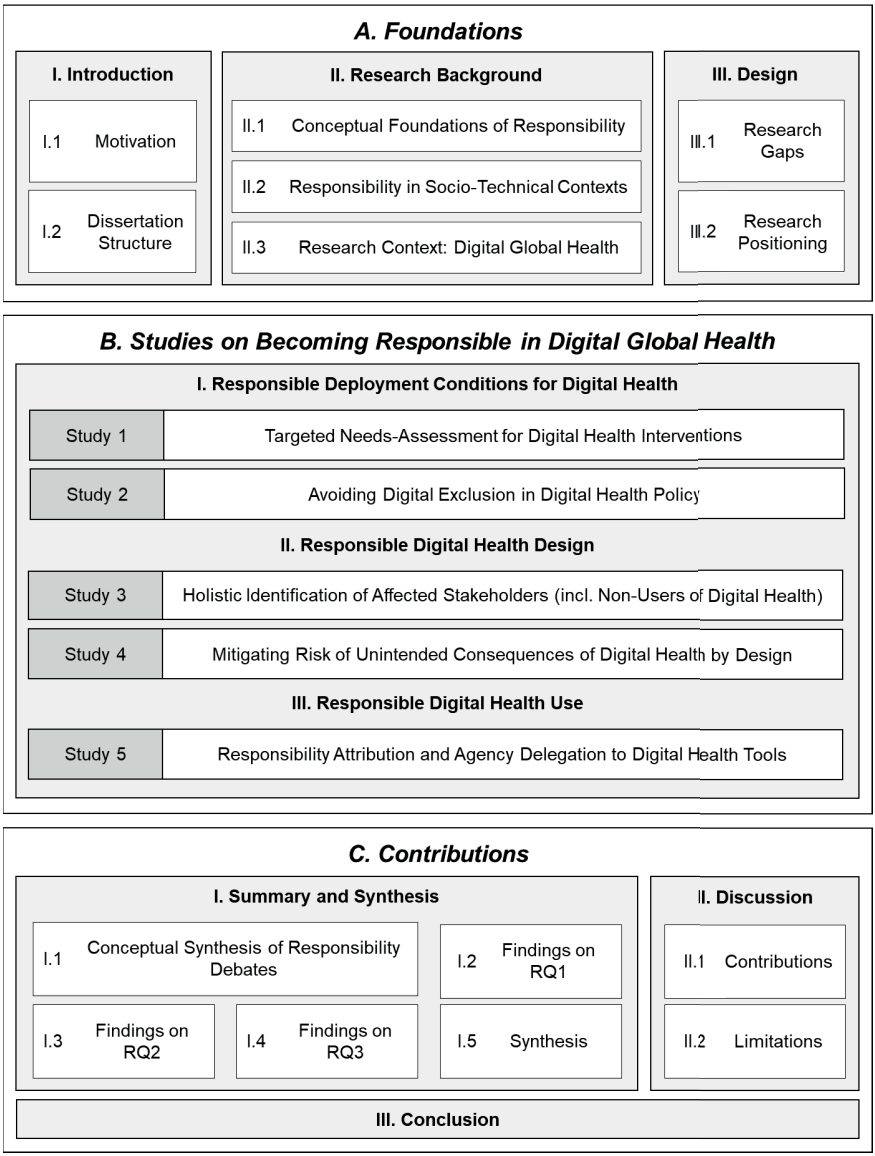

Figure 1. Structure and Contents of this Dissertation

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II. Research Background

As highlighted in Section A.I, this dissertation is motivated by the dual capacity of digital technologies to generate substantial benefits and serious harm. As digital technologies increasingly mediate everyday life, work, and public services, their consequences extend across nearly every dimension of human experience. When digital technologies produce harmful outcomes, the effects are not merely technical: they can undermine well-being, reproduce inequalities, constrain human agency, and weaken the institutions and services on which people depend. Responsibility is both a lens for understanding how such harms emerge and a normative concept describing how they can be anticipated and prevented in socio-technical contexts. To develop an in-depth understanding of existing conceptualizations, Chapter A.II.1 presents the foundational underpinnings of responsibility, before Chapter A.II.2 examines how it manifests within socio-technical contexts.

This dissertation is grounded in different research streams, as shown in Figure 2. For one, it draws on analytical philosophy, which offers a foundational lens on responsibility and related notions such as accountability and moral agency. Next, it incorporates technology ethics literature, which explores the ethical implications of digital technologies for individuals and society, particularly where technological systems shape critical outcomes such as well-being, autonomy, and equity. Finally, it is informed by IS discussions on (digital) responsibility and technology agency, which this dissertation aims to extend. The empirical setting for this dissertation is digital global health, introduced in Chapter A.II.3. This domain is particularly well suited for studying responsibility in complex digital environments, as it combines high-stakes consequences (e.g., patient welfare, health equity) with distributed networks of stakeholders (i.e., including technology developers, healthcare providers, policymakers, and patients) operating across diverse and often resource-constrained institutional environments.

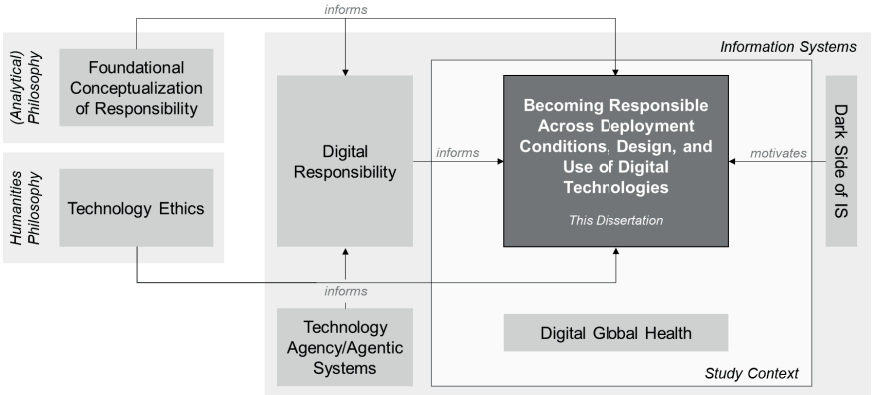

Figure 2. Relevant Research Streams

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II.1 Conceptual Foundations of Responsibility

In its dictionary meaning, “responsibility” can be understood as “answerableness”, that is, the state of being accountable for one’s actions, decisions, or their consequences (Kallen, 1942). Etymologically, responsibility therefore concerns the relation between an actor, an action, and the outcomes for which that actor may be expected to provide justification, accept blame, or assume an obligation to respond. However, responsibility cannot necessarily be referred to as a single concept (Hart, 1968). Rather, it is multifaceted, spanning ethics, law, and social psychology, and is often described as a "syndrome of concepts" rather than a single unified idea (Faroldi, 2014). To understand the complexity and multidimensionality of (digital) responsibility, it is necessary to understand the foundational assumptions regarding responsibility to provide the conceptual basis for analyzing how responsibility is assigned, distributed, displaced, or obscured when technologies are deployed and designed or become involved in human action and decision-making through their use. Hence, this chapter presents both the classical (II.1.1) as well as contemporary (II.1.2) philosophical discussions on responsibility.

II.1.1 From Aristotle to Sartre: Classical Views on Responsibility

Discussions about responsibility are not new. In fact, most contemporary debates regarding aspects relevant to responsibility, such as accountability, free will and moral agency, are rooted in the writings of Aristotle’s *Nicomachean Ethics* (350 B.C.E.). In Book III, Aristotle formulates what remains the first systematic theory of moral responsibility in Western philosophy (Eshleman, 2016). His most fundamental claim is that individuals are morally responsible, that is, they can be praised or blamed, only for actions that are voluntary (*hekousion*). This requires control, meaning the causal origin of the action must reside within the agent, and knowledge, meaning the agent must act with awareness of the relevant circumstances. Ignorance may excuse responsibility if it is not self-inflicted, but if it results from negligence, such as drunkenness or willful ignorance, an individual remains morally responsible. Importantly, Aristotle argues that responsibility is tied not merely to action but to choice (*prohairesis*), that is the deliberate, rational choice of ends and means within one’s power. However, reality rarely conforms to binary distinctions and many actions are neither purely voluntary nor purely involuntary, but performed under pressure or due to situational necessity. Aristotle calls these *mixed actions*, that is, actions performed under pressure or due to situational necessity. While these actions are formally voluntary in that the agent chooses to perform them, they are also partially involuntary, as no rational individual would freely select them under ordinary conditions. Aristotle’s famous example is a captain throwing his cargo overboard during a storm to prevent the ship’s sinking. The decision is made under duress, yet it is not coerced in the strict sense, as the captain retains agency. Hence, moral responsibility presupposes that a person is capable of reasoning about and having the power to choose alternatives.

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