Is Ethics Really Such a Big Deal? The Influence of Perceived Usefulness of AI-based Surveillance Technology on Ethical Decision-Making in Scenarios of Public Surveillance

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Abstract

So far, ethical perspectives have been neglected in empirical research focusing on the acceptance of artificial intelligence (AI)-based surveillance technologies on an individual level. This paper addresses this research gap by examining the individual moral intent to accept AI-based surveillance technologies deployed in public scenarios. After a thorough literature review to identify antecedents of moral intent, we surveyed n = 112 American participants in an online survey on mTurk and analyzed the data by using a fuzzy set qualitative comparative analysis. The resulting antecedent configurations provide insights into the inherent ethical decision-making process and thus contribute to a better understanding of the causality for accepting or rejecting AI-based surveillance technologies. Our findings emphasize in particular the influence of perceived usefulness of the technology on the ethical decision-making process.

1. Introduction

The COVID-19 pandemic at the beginning of 2020 is shaking up the entire world. The outbreak has raised awareness for the need for surveillance technology to contain the spread of such viruses [1]. Governments, including China, are exploiting artificial intelligence (AI) surveillance for such purposes [2]. In particular, facial recognition systems (FRS) can monitor individuals using cameras and compare facial features with stored images and information in databases [3]. Recent developments in deep learning techniques, such as deep convolutional neural networks, have enhanced the ability to recognize biometrics with high precision and assign them to individuals [4].

The use of AI for surveillance purposes is generally regarded as ethically debatable in Western liberal spheres [3]. However, in historically unprecedented times, such as the COVID-19 pandemic in 2020, ethical concerns may be laid aside for the greater good. Discussions on limiting privacy rights have been held in countries, such as the USA, to monitor infected individuals and containing the spread of the virus [5]. But where is the limit to the application of AI-based surveillance technologies for the subjective moral compliance of their deployment? Our study aims to provide insights into this ethical decision-making (EDM) process. To this end, we use the terms "moral" and "ethical" in accordance with Jones [6] interchangeably.

Research linking the use of technology with EDM processes has already been intensively pursued in areas such as software piracy [7] and illegal file sharing [8]. Recently, ethical considerations regarding the use of AI technologies have become the focus of attention from both scientific [9] and political [10] perspectives. Artificial intelligence is an umbrella term for various algorithms and technologies capable of learning, feeling, acting, or understanding their environment [11]. Such technological capabilities can invoke hypothetical scenarios in which machines will take over the world. Given the sophistication of the technology this is not realistic. The contemporary ethical reservations against AI include issues such as the bias and discrimination against people introduced by non-diversified training sets, or concerns about how governments will use such technologies to impose their views on morality [9]. In the case of the latter, there are situations where governmental surveillance is employed for national security purposes (e.g., for containing a pandemic [12]). However, it has been shown that surveillance technologies can be abused by administrations, as revealed in the Edward Snowden affair in 2013 [13].

Ethical considerations in this context have so far been kept on a conceptual level without examining the perspective of the monitored subject [12, 14]. Previous empirical studies dealing with public surveillance predominantly examined privacy and trust aspects affecting the public acceptance of surveillance technologies [13, 15, 16]. There is a need to empirically

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explore the propensity to accept such technologies trough an ethical lens, as ethical questions are of particular importance in scenarios where information systems (IS) are utilized in the public sector. Their application can have far-reaching social implications, which may result in discrimination against individuals or groups despite benevolent governmental intentions [17]. Generally, it is not a pragmatic question under which circumstances the use of AI surveillance technologies is ethically justified [14, 18]. Rather, it is a question in the realm of discourse ethics, demanding a social consensus on the moral rightness of its application [19]. Yet, achieving such universally valid norms is of hypothetical nature. Nevertheless, it is important to obtain a moral compass in this regard to guide policy and avoid misuse [14, 18]. This study takes a first step in this direction by aiming to gain insight into the EDM process with respect to the moral acceptance of such technologies by addressing the subjective and ethical dichotomy between the invasion of privacy and public safety when AI-based surveillance technologies are used in public scenarios. We are particularly interested in the relationship between the perceived usefulness of AI-based surveillance and individuals' moral consent for public monitoring.

Previous research examining the complex and subjective process of reaching an ethical judgment focuses on net effects of single antecedents affecting the moral intent to conduct a particular behavior [7, 20]. Moral intent is analogous to behavioral intent in scenarios where ethical issues are the focus [6, 21]. However, such an approach does not reflect the complex causality of EDM. The complexity and subjectivity of EDM rather implies that different factors are causally interrelated and have a combined influence on the process [22]. Therefore, we use a configurational lens to study the EDM process affecting individuals' moral intent to accept AI-based surveillance technologies applied in public contexts. In order to particularly examine the causal influence of perceived usefulness on the ethical judgment, we ask the following research question (RQ):

How does the perceived usefulness of AI-based surveillance technologies affect the moral intent to accept the public application of these technologies?

To answer the research question, we surveyed $n = 112$ participants and analyzed the data by conducting a fuzzy set qualitative comparative analysis (fsQCA). This method constitutes a case-based approach that considers configurations of antecedents and their causal combined effect on an outcome [23]. This study contributes to the understanding of the factors that affect the moral intent to accept AI-based surveillance technologies. Specifically, it addresses the influence of perceived usefulness on the moral reasoning process. In this way, we expand the EDM and acceptance literature by combining constructs from both streams to integrate ethical and technology acceptance considerations and provide practitioners with an understanding of the public's ethical evaluation process with respect to AI-based surveillance technologies.

2. Theoretical Background

2.1. AI-based Surveillance

According to Feldstein [3], AI-based surveillance can be classified into three areas: smart cities, FRS, and smart policing. Smart cities use real-time data gathered by sensors and cameras to control and regulate public services by carrying out actions such as directing emergency vehicles or preventing traffic jams, while FRSs use biometric technologies and cameras to identify individuals. Smart policing refers to the process of crime prevention by predicting criminal acts based on the combination of data gathered from sources such as social media and the utilization of real-time data such as recordings from FRS [3].

Technological advancements in data processing and algorithmic enhancements enable governments to diffuse AI technologies in the public sector to process large amounts of data [4]. The governmental application of such technologies is mainly promoted under the veil of "protection" with the intent to prevent crimes [15], controlling epidemics [1], and strengthening tax legislation [13]. However, from a liberal perspective [3] more ethically controversial applications can be examined by considering the example of China's "social credit system" which is an example of massive state AI-based surveillance involving the assessment of an individual's behavior and the respective social bonus and stigma [24]. The ethical controversy of such surveillance is grounded in the dichotomy between the increase of public security and the decrease of privacy [13, 25]. There is still a limited understanding of the general acceptance of public AI-based surveillance endeavors from the perspective of individual citizens [25]. Our study aims to address this gap and emphasizes the ethical reasoning involved in individuals' decisions to accept or reject such technologies.

2.2. Ethical Decision-Making

This study examines the individual moral intent (MI) to accept AI-based surveillance technologies in scenarios of ethical dilemmas. We adopt the notion of an ethical dilemma as "a situation in which an individual must reflect upon competing moral standards and/or stakeholder claims in determining what is the morally

appropriate decision or action" [26:757]. Furthermore, we define the accompanying terminology of an ethical decision as "a decision that is both legal and morally acceptable to the larger community" [6:367].

The intent to engage in a certain behavior is a central component of common theoretical frameworks in IS acceptance research, such as the theory of planned behavior (TPB) [27] or the technology acceptance model (TAM) [28]. MI is a specific form of behavioral intent which constitutes a predictive measure of the actual behavior in ethical contexts [21, 29]. Depending on the context and the theoretical framework, behavioral intentions can be explained by various antecedents.

In its original form, the TAM comprises the independent variables perceived ease of use (PEOU) and perceived usefulness (PU), thus considering perceptions of technology-related aspects to explain behavioral intent [28]. The TAM is generally utilized for studying the adoption of information systems [30]. This study rather has a behavioral background by examining the individuals' behavioral intentions to accept AI-based surveillance technologies from a moral viewpoint. The TPB follows a behavioral-focused framework. The model uses attitude, subjective norm, and perceived behavioral control to predict behavioral intentions [27]. However, in their original forms, both the TAM and the TPB do not consider ethical components when explaining intent.

The concept of behavioral intent as a predecessor of the actual behavior is consistent with models of EDM [6, 31]. The four-component model of EDM developed by Rest [31] postulates that ethical or unethical behavior is based on MI. This in turn is influenced by the moral judgement of an individual, which describes "the way a person reasons when faced with an ethical problem" [32:36]. The decision-making process is only set in motion when an individual recognizes the situation as a moral issue [31]. In our context, accepting governmental endeavors to implement AI-based surveillance technologies cannot be generalized as an ethical or unethical behavior; instead, the assessment is dependent on the circumstances and the situational perception of an individual [13]. Nevertheless, endorsing technologies that render citizens transparent by monitoring them at every step can be recognized as an ethical dilemma despite deployments which have benevolent intentions of public safety in mind [3].

Rest's model [31] is the basis for several studies for explaining unethical behavior using IS [7, 33] and also serves as a foundation for other theoretical models in the EDM literature [6, 7]. Jones' [6] issue-contingent model extends the four components of Rest's [31] EDM process by introducing the moral intensity construct, which measures "the extent of issue-related moral imperative in a situation" [6:372]. Moral intensity focuses on the issue itself and its effect on all stages of the EDM process within a contingency framework [6]. However, since decision-making processes are highly subjective and rely on the perceptions of individuals, the moral intensity construct is criticized for only incorporating issue-related components to assess the importance of a situation. It is also a construct which is difficult to measure [7, 20, 21]. Thus, Robin et al. [20] developed a measurable construct inspired by moral intensity that considers the importance of the ethical issue, but incorporates the subjective perceptions or perceived importance of the ethical issue.

3. Research Model

Building on the models discussed above, we base our research model (depicted in Figure 1) on the notion that "ethical judgements and intentions should be better predictors of behavior in situations where the ethical issues are central, rather than peripheral" [34:9]. Therefore, we incorporate antecedents from the ethical decision-making literature into the research model [7, 20] affecting the dependent variable *moral intent to accept AI-based surveillance technology*. The antecedents are derived from existing research that considers ethical reasoning to be a cognitive process [7, 20, 31]. Our research model also draws on existing literature that views the process of ethical decision making from a contingency perspective and emphasizes the influences of situational [6] or individual [26] factors. In line with the contingency approach, we assume that the EDM process is characterized by its complexity and that ethical decisions can be explained by a mix of factors [22]. To shed light on the causality of the composite of antecedents, we apply a configurational approach in this study.

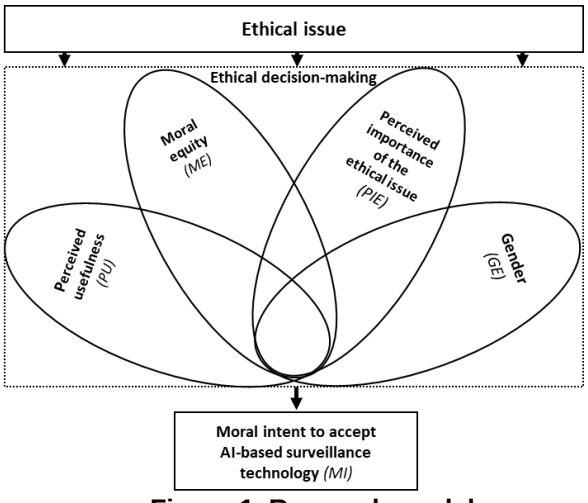

Figure 1. Research model

Moral equity (ME): We use ME as a measure of the participants' judgement as to whether accepting AI-based surveillance constitutes an ethical or unethical behavior in the context of the ethical dilemmas presented to the participants. The construct includes fairness, justice, morality and acceptability of the family which reflect components expressing a general understanding of "ethical" [20, 35]. ME has been utilized as a construct of moral judgment in previous research [7, 20]. The effects of ME on MI are ambiguous and showed causal links to the present level of perceived importance of the ethical issue. The fsQCA approach used in our analysis is suitable for identifying such causal relationships and providing contextual explanations for them [22].

Perceived importance of the ethical issue (PIE): We incorporate PIE into our research model because this construct has shown effects on MI as well as moral judgment factors in previous studies in the IS field [20, 33, 36]. According to Banerjee et al. [32], the importance of the situation can have such a strong impact on MI that moral judgment and attitudinal factors are less influential. The perception that an ethical problem is of high importance can promote the MI of ethical behavior [36].

Perceived usefulness (PU): In our study, participants do not use the technology directly; thus, the usability factor of the TAM is irrelevant within our context (PEOU). PU, on the other hand, defines the perceived "competence of AI in completing tasks and finishing those tasks in a consistent and reliable manner" [9:51]. A high PU can increase the perceived value of a technology, affecting the acceptance of a particular technology [30]. In the context of video surveillance, PU of security and safety aspects is considered a decisive factor in the emergence of technology acceptance [13, 37]. We argue that a high PU in regard to public security could also influence the moral reasoning in order to accept AI-based surveillance technologies in the presence of an ethical issue.

Gender (GE): Gender has been argued to be a particularly crucial individual trait that explains differences in EDM [38, 39]. Women are generally considered to be more morally grounded and sensitive to ethical issues in their behavior, which is why their ethical intention formation can be regarded as higher than that of men [38]. We include GE in our research model in order to generate new insights into the causal EDM process, especially in conjunction with the PU factor.

4. Research Approach

4.1. Data Collection and Sample

The first phase of the successive multi-step approach of this paper comprises the development of the study design including the construction of the web-based questionnaire. We followed a scenario-based approach informed by the literature on ethical decision-making [7, 20, 35]. Scenarios are suitable for dispersing idiosyncrasies [7] and communicating ethical problems to survey respondents in an easy and understandable way [20]. We developed three scenarios of ethical issues in the context of AI-based surveillance, outlining the conflict between the increase of public safety and the invasion of privacy. The technological emphasis in these scenarios focuses on FRS. The scenarios were selected so that the importance of the ethical problem differed in each scenario (Sc-1: medium PIE; Sc-2: high PIE; Sc-3: low PIE). We chose PIE as a distinguishing element because the construct demonstrated mediating effects between ME and MI in previous variance-based approaches [7, 20]. Our configurational method enabled us to gain new insights into the inherent causal relationship between these variables. All scenarios describe the usage of FRS while differing in the purposes of the application. The scenarios involved monitoring jaywalking (Sc-1), tracking COVID-19 patients (Sc-2), and preventing pickpocketing (Sc-3). The scenarios were presented in a preliminary study to 10 participants who confirmed the initial PIE assessment of the researchers. The pre-study also served to refine the questions which followed the description of the scenarios. Constructs and items applied in the survey were adopted from existing validated measures which we identified based on a thorough literature review. We utilized the constructs PIE and ME from Robin et al. [20], PU from Venkatesh and Davis [40], and MI from Haines and Haines [7] for our context. Items were measured based on a seven-point Likert scale. The exception to this was GE, which was determined by a dichotomous scale. A detailed overview of the survey scenarios, constructs, items and scales is provided in the appendix at https://bit.ly/3gZttHe.

The data collection took place in April 2020 by conducting the online survey based on mTurk. To ensure data quality with mTurk, we removed all cases where a shorter time was taken to answer the questions than was needed by the fastest respondent in our pre-study. We looked at anomalies in the data, including response patterns or inconsistencies with the reverse coded questions [41]. Moreover, we included attention check questions in the survey to validate the answers [42]. We removed 88 cases from the initial 200 completed questionnaires. Completion of the survey

was rewarded with 0.20$. The descriptive statistics of the remaining n = 112 respondents' demographic data is shown in Table 1. We have an almost equal distribution between women (49.11%) and men (50.89%) in our data set. The data shows a relatively heterogeneous distribution in terms of age with a high percentage of subjects in their 30s (32.14%). Most of our participants had college education experiences (96.43%). All of the participants were from the USA; we chose this constraint in mTurk to limit the diversity of cultural norms influencing the EDM and to target a more liberal culture in terms of AI-based surveillance compared to Asian cultural regions, which are more assimilated to the presented scenarios [3].

Table 1. Descriptive statistics of the respondents' demographical data (n=112)

Characteristic	Absolute	Relative
Gender		
Male	57	50.89%
Female	55	49.11%
Age		
19-30	33	29.46%
31-40	36	32.14%
41-50	19	16.96%
50<	24	21.43%
Education level		
High school	4	3.57%
College degree	108	96.43%

4.2. Measurement and Validation

We validated the fit of our a priori research model by performing a confirmatory factor analysis (CFA) with the observed data [43]. First, we tested for common method bias by performing Harman's single-factor test. For each individual scenario, the value for a single factor explaining the covariance among measures was below the threshold of 50%, indicating that there was no significant threat of common method bias [44]. Next, we determined the internal consistency reliability of our latent constructs by calculating the Cronbach's alpha (α) and the composite reliability in each scenario. The constructs exceeded the recommended cutoff of 0.7 [43]. In order to achieve construct validity, we checked for convergent and discriminant validity. By calculating the Average Variance Extracted (AVE), we assessed the convergent validity of the measurement model. The estimates ranged between 0.619 and 0.763 for scenario 1, 0.645 and 0.815 for scenario 2, and 0.605 and 0.803 for scenario 3, thus surpassing the threshold of 0.5 [43]. In addition, the discriminant validity was confirmed by considering the Fornell-Larcker criterion, which states that the square root of a construct of the measurement model must be less than the value of the correlations with another factor [45]. The discriminant validity was further supported by the calculation of the heterotrain-monotrait (HTMT) ratio of correlations. The values were below the limit of 0.85 in all scenarios, indicating that constructs were not highly related to each other [46]. Detailed results of our measurements can be found in the appendix at https://bit.ly/3gZttHe.

4.3. Fuzzy Set Qualitative Comparative Analysis

We exploited the strengths of fsQCA for our study, which include conjunction (combining fuzzy set logic and Boolean algebra to analyze combinational variable effects on an outcome), equifinality (an outcome can be accounted for by different configurations of variables), and asymmetry (the occurrence of an outcome influenced by a variable is not necessarily triggered by its presence, but can also be caused by its absence) [47]. To conduct the fsQCA, we proceeded with the calibration and analysis of necessary and sufficient conditions.

Our construct composite scores were converted into fuzzy set membership scores between 0 and 1 as part of the calibration process (level of membership). The interval limits are defined as 0 (full non-membership), 0.5 (crossover point), and 1 (full membership) [48]. All values in between these limits constitute intermediate conditions; e.g. the perceived importance of an ethical problem can be considered as very important (full membership) or very unimportant (full-non membership), but also as being in between these limits (somewhat important or somewhat unimportant) [47]. The empirical data was converted during calibration based on the data and substantive knowledge using three anchor points [49]. Studies that use a 7-point Likert scale employ the Likert scale itself to indicate the qualitative anchor points (i.e., 1 for full non-membership, 4 for the crossover point, and 7 for full membership) [41, 50]. However, such a calibration strategy does not address the underlying distortion of the data distribution, which could misrepresent the data [51]. Therefore, we adopted the calibration strategies of Duarte and Picoto [52] by setting the anchor values to the 5^{th} percentile for full non-membership, the median for the crossover point, and the 95^{th} percentile for full membership. By doing so, we took into account the data distribution and the logit function of the "QCA" package for R which was utilized for the calibration. In accordance to previous studies [47, 52], we avoided membership scores of 0.5 by applying a 0.001 constant. We calibrated the dichotomous scale of gender as a crisp set, using 1 for male and 0 for female.

For the next step, we utilized the fsQCA 3.0 software. The analysis of necessary and sufficient conditions is a set-theoretical analysis, which is carried out by identifying supersets (necessary conditions) and subsets (sufficient conditions) of an outcome (presence or absence of MI). Antecedents "may be considered necessary if they must be present for an outcome to occur, and sufficient if they can produce an outcome by themselves" [47:802]. We set a consistency threshold of 0.9 for a variable to be considered a necessary condition [53]. We conducted a truth table analysis to determine sufficient conditions. A truth table provides an overview of possible variable combinations, resulting in an outcome. By setting a consistency cutoff value of 0.85 and a frequency threshold of >= 2 empirical cases [41, 49], we ensure a high consistency and coverage of configurations, explaining the presence or absence of MI. We further set a limit of proportional reduction in inconsistency scores of greater than 0.65 [47, 54], to avoid variable combinations, explaining the presence as well as the absence of an outcome [47].

5. Necessary and Sufficient Conditions

The calibrated constructs were analyzed to determine whether they are necessary for the occurrence of MI to accept AI-based surveillance technologies. We further examined the existence of necessary conditions for the negation of MI (~MI), and thus the necessity of conditions for not intending to accept the technology in a particular ethical scenario. The results show values below the consistency threshold of 0.9, indicating that a necessary condition was not present in either of the scenarios (cf. estimation details in the appendix at https://bit.ly/3gZttHe). However, ME revealed its relevance as a condition, with consistency values just below 0.9 and high coverage values (>0.7) in all scenarios. PU also revealed high consistency and coverage estimates, especially in the jaywalking (Sc-1) and COVID-19 (Sc-2) scenario. In addition, the negation of PU and ME (~PU, ~ME) demonstrated estimates with a tendency for constituting a necessary condition, explaining ~MI. However, necessary conditions are not sufficient for the outcome to occur [49].

In order to identify sufficient conditions, we created a truth table for each scenario. We then applied a counterfactual analysis to the truth table for each scenario utilizing the Quine-McCluskey algorithm [22]. The counterfactual analysis simplified the truth table, creating a parsimonious solution resting on difficult counterfactuals and an intermediate solution incorporating easy counterfactuals [55]. The resulting configurations from the analyses are shown in Table 2.

The notation was adopted from Ragin and Fiss [48]; the presence of conditions was symbolized by black dots (●) and the absence was symbolized by crossed-out circles (⊗). The size of the circles indicated peripheral sufficient conditions (small icons) or core sufficient conditions (big icons). Peripheral conditions were associated with easy counterfactuals and core conditions with difficult counterfactuals. An empty field in the notation suggested a "don't care" condition, representing a subordinate role of the antecedent, and hence its presence or absence had no effect on the outcome [41].

Table 2. Sufficient conditions for MI and ~MI

			Configurations			
			MI		~MI	
#	Antecedents		1	2	3	4
Sc-1	ME		●		⊗	
	PIE		●			⊗
	PU		●		⊗	⊗
	GE*					⊗
Sc-2	ME			●	⊗	
	PIE		●	●		
	PU		●	●	⊗	
	GE*		⊗			
Sc-3	ME		●		⊗	
	PIE		⊗			
	PU		●		⊗	
	GE*		●		●	
Consistency		Sc-1	0.890	-	0.959	0.919
		Sc-2	0.905	0.892	0.905	-
		Sc-3	0.890	-	0.941	-
Raw coverage		Sc-1	0.671	-	0.643	0.290
		Sc-2	0.334	0.619	0.705	-
		Sc-3	0.208	-	0.354	-
Unique coverage		Sc-1	0.671	-	0.396	0.042
		Sc-2	0.082	0.366	0.705	-
		Sc-3	0.208	-	0.354	-
Overall solution consistency		Sc-1	0.890		0.945	
		Sc-2	0.895		0.905	
		Sc-3	0.890		0.941	
Overall solution coverage		Sc-1	0.671		0.686	
		Sc-2	0.701		0.705	
		Sc-3	0.208		0.354	

Legend: * = presence/negation reflects "male"; ● = presence of an antecedent; ⊗ = negation of an antecedent; big circle = core element; small circle = peripheral element; blank space = subordinate antecedent

The analyses for MI as an outcome resulted in one configuration for Sc-1 (Sc-1.1) and Sc-3 (Sc-3.1) and two configurations for Sc-2 (Sc-2.1, Sc-2.2). The results for ~MI as an outcome showed a single configuration for each of the scenarios Sc-2 (Sc-2.3) and Sc-3 (Sc-3.3), as well as two configurations for Sc-1 (Sc-1.3, Sc-1.4). The scenarios with two configurations represented neutral permutations because the combinations of variables were grouped around the respective core condition, thus indicating within-type equifinality [49]. The relevance of the configurations was expressed by the raw or overall coverage of the solutions [48]. By covering a substantial number of empirical cases, the configurations represented in Sc-1 and Sc-2 for MI (Sc-1: 0.671; Sc-2: 0.701), and ~MI (Sc-1: 0.686; Sc-2: 0.705) as an outcome, constituted configurations of high relevance. This explained the respective outcome with a high consistency. In contrast, the configurations in Sc-3 were less relevant, outlined by the low overall coverage for MI (Sc-3: 0.208) and ~MI (Sc-3: 0.354) as an outcome.

MI as an outcome: The configuration in the jaywalking scenario (Sc-1.1) for MI as an outcome was dominated by the core condition PU and the peripheral conditions PIE and ME, while gender occupied a subordinate role. In the COVID 19 scenario (Sc-2), the core condition within the neutral permutations was occupied by PIE. Next to PIE, in Sc-2, MI was peripherally influenced by the presence of PU and the absence of GE (female) in configuration Sc-2.1, and by the presence of PU and ME in configuration Sc-2.2. Configuration Sc-2.2 represented the more relevant conglomerate of variables as it had a higher raw and unique coverage than configuration Sc-2.1. The core condition of the pickpocketing scenario (Sc-3.1) was the absence of PIE, and thus the configuration was mainly influenced by the perception the ethical issue as unimportant. MI was further supported by the peripheral condition ME, PU and GE (male).

~MI as an outcome: The neutral permutations of Sc-1 for explaining ~MI were mainly influenced by the absence of PU and differed in peripheral conditions (~ME in Sc-1.3; ~PIE, ~GE (female) in Sc-1.4). Configuration Sc-1.3 was substantially relevant, with a raw coverage of 0.643 and a unique coverage of 0.396 (in contrast to Sc-1.4, which showed estimates of 0.290 and 0.042). The resulting configuration in Sc-2 (Sc-2.3) was equal to Sc-1.3. In Sc-3.3, the configuration also resembled this pattern, but the configuration was additionally influenced by the presence of the peripheral condition GE (male).

6. Discussion

6.1. Main Findings

The results of our deductive fsQCA approach provide insights into the causal pathways of EDM regarding whether to accept AI-based surveillance technologies in scenarios of ethical dilemma. We outline three possible scenarios of public AI-based surveillance for 112 survey participants, describing ethical issues raised by the conflict between technology-induced increase in public safety and the invasion of privacy.

PIE at the core of the EDM (Sc-2): The highest perceived importance of an ethical issue is assigned to Sc-2 (the monitoring of COVID-19 patients). PIE constitutes the core condition in the derived neutral permutations (configurations Sc-2.1 and Sc-2.2). Previous studies have shown that high levels of PIE indicate decisions which are grounded on a moral foundation and generally lead to ethical behavior [20, 33]. Following this line of reasoning, accepting AI-based surveillance technology for monitoring COVID-19 patients is regarded as "ethical" in these configurations. This is supported by the presence of ME in configuration Sc-2.2, which implies the perception of ethical behavior. However, ME and PU show a peripheral effect on moral reasoning in Sc-2.2. The particularly high moral stakes in the COVID-19 scenario are interpreted as so severe that the invested efforts for processing the situational morality leave little room for other factors (such as PU) to influence the cognitive process [6].

Interestingly, Sc-2.1 covers females with a high level of PIE who base their peripheral ethical reasoning solely on the PU of the technology, instead of on moral grounds such as fairness or justness. This could be explained by the socialization approach, which suggests moral differences between sexes due to the internalization of cultural idioms [39]. Studies have shown that females have a higher baseline for ethical intention formation [38, 39]. Our study shows that women tend to weigh technological aspects in their EDM on an already high moral basis.

PU at the core of the EDM (Sc-1): Sc-1 describes situations inspired by the Chinese social credit system, in which pedestrians crossing the road are monitored by FRS and fined for misconduct under traffic law [24]. The single configuration derived from our analysis (Sc-1.1) shows little influence from PIE and the perception of conducting an ethical behavior (ME) on the intent to accept the AI technology. Instead, moral reasoning is predominantly influenced by PU. The low influence of PIE leads the moral decision to be weighed against other factors [33]. For this purpose, our participants in this

configuration mainly focus on PU and conclude their MI as ethical (indicated by the presence of ME).

The absence of PIE dominates the ethical decision-making (Sc-3): The third scenario is based on FRS, deployed in the context of smart policing used to prevent pickpocketing in public places [3]. As a counterpart to Sc-2, where a high level of PIE determines the outcome, the importance of the ethical issue is decisively low in Sc-3. Research has shown a propensity for unethical behavior in scenarios with low PIE levels, as decisions are not founded on moral stances [20, 33]. Interestingly, this configuration covers only a small portion of the empirical cases that explain MI, which are predominantly male. This confirms previous research, which indicates that men in the USA tend to have less ethical awareness than females [39]. However, the relatively low overall coverage renders the configuration less relevant [49].

The absence of PU dominates the outcome of ~MI: The strong impact of PU on EDM is evident when considering the causality of the absence of the intent to accept AI technologies. In all three scenarios, the main influence on the moral reasoning for ~MI as an outcome is the absence of PU. The impact of the fact that the scenarios are not considered to be ethical plays a small part in the decision. Although a strong influence of PU on acceptance is not surprising in light of previous studies [13, 37], its constituting the main influence on disapproving the technology, particularly in moral scenarios, is striking.

6.2. Implications for Research and Practice

The derived configurations contribute to research by revealing the importance of perceived usefulness within the inherent EDM process affecting the MI to accept AI-based surveillance technology. We found PU to be a decisive factor, particularly in scenarios where the perceived importance of the ethical issue is positioned in the "gray area" [33:318]. The conjunction of PIE with other factors indicates that PIE affects moral reasoning by determining the effects of other antecedents. This supports previous findings linking PIE as a mediator between ME and MI [7, 20]. Our results show that PIE may also function as a mediator between PU and MI, which should be validated in future variance-based research projects. Therefore, we draw attention to the complexity and the causal relationship between technology acceptance and ethical considerations as we integrate both perspectives into a theoretical framework. Furthermore, our configurations also provide insights into the causal linkages for the MI to reject the use of technology. Surprisingly, the highly relevant configurations in all scenarios influence the outcome (~MI) almost identically. The determining factor is the lack of PU, and this impacts the ethical decision more than the perceived immorality within the scenarios. PU has previously been identified as one of the strongest indicators of acceptance [13, 37]. We expand on the understanding of PU effects by showing that its absence is the main cause of the rejection of AI-based surveillance technologies in moral frameworks. In addition, our results on gender influences on MI show that men tend to accept AI-based technologies even without high PIE levels. Thus, in the context of our study, we confirm previous results which attribute a higher moral foundation to women [38]. Overall, we demonstrate that PU is a decisive factor influencing EDM and needs more attention in IS research. Our study contributes to the ethical sphere in the IS literature, which has been underrepresented in the past [17].

These findings hold implications for governmental institutions and private organizations by providing measures to raise the acceptance of AI-based surveillance in scenarios of ethical dilemma. Providing information and communicating the legitimacy of state surveillance must be carefully assessed to ensure acceptance by the general public [13]. In a still uncharted area of AI governance [9], decision-makers should take targeted actions based on the ethical importance of the situation to increase acceptance of their AI-based surveillance endeavors. Such an initial assessment of PIE could be built on the sentiment of microblogs and citizen's information sharing behavior [56]. In scenarios where PIE is neither very strong nor very low, or where the technology is generally rejected, public information should focus on emphasizing the usefulness of AI-based surveillance technologies. Our results empirically show that the lack of perceived usefulness is connected to the ethical dimension. Therefore, our study supports the argument of the AI Ethics Guidelines of the European Commission, which stresses that even "if an ethical purpose is ensured, individuals and society must also be confident that AI systems will not cause any unintentional harm" [10:7]. Accordingly, we encourage researchers, policy makers and organizations to consider both the technical and socio-ethical realms of AI-based surveillance technology to demonstrate the usefulness of the technology. Particularly in light of the broad definition of AI as an umbrella term for various technologies, it is often not transparent what AI actually is and what it is capable of. Due to this uncertainty, the benefits of the technology are often difficult to grasp [11].

6.3. Conclusion, Limitations and Directions for Future Research

Our findings should be interpreted in light of their limitations. First, our data was collected with mTurk, a

portal which cannot avoid the challenges of controlling data reliability. However, we followed common guidelines to ensure data quality, including attention check questions and reverse coding [42]. Another limitation of our results is linked to its non-generalizability, which is due to our convenient sampling. Nevertheless, we regard mTurk users in the USA as a suitable sample to show the liberal view of our research subject because this population deals sensitively with privacy issues [57]. Future research could emphasize and validate the results in other cultural regions with a more diverse population. Lastly, we refer to the research model, which includes central constructs that affect the MI, derived on the basis of a thorough literature review. However, we cannot guarantee that all possible causal influences on MI are covered. For example, cultural aspects, trust or algorithmic transparency might also contribute to the causal effects influencing MI, which should be considered in future work.

We believe that despite the limitations of this study, the insights gained into the inherent EDM process for the emergence of MI increase the understanding and anticipation of responses to future AI-based surveillance programs that have public safety in mind, such as halting the spread of COVID-19.

7. References

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