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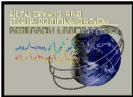
Ethical Support for ERSS1 Principles

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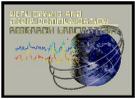
Ethical Support for ERSS1 Principles

Abstract:

The rapid advancements in large language models (LLMs) have revolutionized natural language processing, unlocking unprecedented capabilities in communication, automation, and knowledge generation. Despite widespread discussion about the ethical compliance of LLMs—especially concerning their data harnessing processes—there remains a notable absence of concrete frameworks to systematically guide or measure the ethical risks involved. Ethical Risk Scoring (ERS) system is a sample framework to quantitatively assess the ethical integrity of the data harnessing process for AI systems. This system is based on a set of assessment questions grounded in core ethical principles, which are, in turn, supported by commanding ethical theories. By integrating measurable scoring mechanisms, this approach aims to foster responsible LLM development, balancing technological innovation with ethical accountability. The test questions for ERSS have been designed based on 27 ethical principles which are required to be upheld from an ethical system. These principles are supported by at least 10 dominant ethical theories. This document lists the ethical theories used, the list of principles, and finally the support level to the principles from each theory. More details of the work can be found in upcoming publications.

1. List of 10 Dominant Ethical Theories

- 1) Utilitarianism: Utilitarianism, introduced by Jeremy Bentham and John Stuart Mill, emphasizes maximizing overall happiness while minimizing suffering. This framework evaluates the morality of actions based on their consequences, prioritizing the greatest good for the greatest number [3,12]. In the context of AI, this perspective could guide decisions such as designing systems that benefit a large population, such as AI-enabled universal healthcare systems, where societal welfare is prioritized.
- 2) Deontological Ethics: Deontological ethics, rooted in the works of Immanuel Kant, focuses on adherence to universal moral duties and rules [12]. This framework asserts that ethical actions must align with moral laws that could be applied universally, regardless of their consequences [3,11]. For example, in AI development, maintaining transparency and honesty in data processing—even when obscuring details might yield better results—aligns with deontological principles. The "categorical imperative" serves as a guiding principle, ensuring that AI systems operate in accordance with universal moral laws [12].
- 3) Virtue Ethics: Virtue ethics, championed by Aristotle, centers on the development of moral character. It suggests that ethical behavior emerges from cultivating virtues such as honesty, courage, and integrity [11,12]. In the context of AI, this framework emphasizes designing systems that reflect virtuous behavior, such as an AI healthcare system demonstrating compassion and honesty in its interactions with patients.



- 4) Ethics of Care: The ethics of care, introduced by Carol Gilligan, shifts the focus from rules and consequences to interpersonal relationships and empathy. This framework argues that ethical decisions must prioritize care, connection, and relational contexts. For instance, an AI system designed to assist in elder care would align with this framework by prioritizing the emotional and physical well-being of its users over rigid cost-efficiency metrics.

- 5) Rights-Based Ethics: John Locke's rights-based ethics emphasizes the inherent rights of individuals, such as freedom, equality, and privacy. This framework is particularly relevant in AI, where respecting the data rights of individuals, free of bias are paramount [7]. For example, AI developers must ensure that user privacy is protected, and systems are designed to prevent bias and unauthorized access to sensitive information.

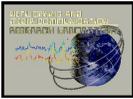
- 6) Social Contract Theory: Social contract theory, rooted in the works of Thomas Hobbes and John Rawls, suggests that ethical behavior arises from agreements between individuals to benefit society [11]. This framework views morality as a product of collective consensus, emphasizing the importance of cooperation and mutual respect.

- 7) Rawlsian Justice: John Rawls' concept of justice as fairness emphasizes impartiality in decision-making to ensure equitable outcomes [7]. Using the "veil of ignorance," Rawlsian justice encourages decision-makers to design systems without knowledge of their own societal position, ensuring fairness for all, particularly the most disadvantaged. For instance, AI algorithms can be designed to prioritize equitable resource distribution, such as improving healthcare access for underprivileged communities.

- 8) Natural Law Theory: Natural Law theory, articulated by Thomas Aquinas, asserts that morality is grounded in universal truths derived from human nature and reason. This framework argues that ethical principles should align with natural rights and human purpose.

- 9) Environmental Ethics: Environmental ethics, championed by Aldo Leopold, expands the scope of morality to include the environment. It emphasizes sustainability and the ethical responsibility of humans to preserve and protect nature.

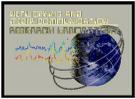
- 10) Pragmatism: Pragmatism, as articulated by William James and John Dewey, advocates for a focus on practical outcomes, adaptability, and effectiveness. This framework suggests that ethical decisions should be guided by their real-world utility and problem-solving capacity. For example, pragmatism in AI might involve implementing renewable energy solutions that balance economic viability with environmental preservation, demonstrating both practicality and ethical consideration.



2. List of Ethical Principles Underlying the ERS System for Evaluation

P-Code	Ethical Principles
H1	The system should do no harm to any individual.
H2	The system should do no harm to an organization.
H3	The system should do no harm to and infrastructure of system.
H4	The system should do no harm to animals.
H5	The system should do no harm to environment.
H6	The system designer should take necessary measures within its control to mitigate the harm.
H7	The system should disclose the net harm potential.
H8	Intentional harm is more unethical than unintentional harm.
H9	Even the unintentional harm is unethical.
H10	The severity of harm is ordered as per harm to individual, environment, animal and organization.
K1	Data should be acquired from the proper owner of the data. It should not be stolen.
K2	Data should be distributed based on the distribution rights granted by the owner (alteration, commercial/noncommercial, attribution, purpose)
K3	The rights of the data subject should be upheld by the data owner.
S1	Any subject has the right to know if data being collected about him/her, what data is being collected, by whom, and for what purpose.
S2	Any subject has the right to know the process of how his/her data is being collected.
S3	Data should not be used for purposes not authorized by the subject.
S4	Any subject has the right to be informed promptly if their data is used for purposes beyond their initial consent, allowing them to restrict such use.
S5	Any subject has the right to withdraw permission for the use of their data later.
S6	Any subject has the right to request copies and download the data about him/her in a readable format.
S7	Any subject has the right to request correction of wrong information in the data about him/her.
S8	An individual has the right to be forgotten i.e. erasure of his/her data
S9	Any subject has the right to restrict how his/her data is being collected, processed, archived, or distributed and optout.
S10	Any subject has the right to not be subject to automatic decision making.
S11	Any subject has the right not to be subject to be used for AI system training.
S12	Any subject has the right to restrict his/her information not to be sold to third party.
S13	Any subject has the right to not be discriminated against for exercising his data rights by denial and restriction of other services. Individuals cannot be denied goods or services, or offered different prices or quality, for exercising their data rights
S14	Any subject has the right to be compensated if any data about him is monetized profit.

Table 1 The Principles



3. The Support for the Principles from the Ethical Theories

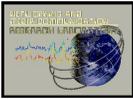
We present the summary tables below, showing alignment of ethical theories with the computing principles. The table uses abbreviations to indicate the level of support each theory provides for the principles: D denotes direct support, where the theory fully aligns with the principle; I signifies indirect support, where the theory supports the principle through broader implications; C represents conditional support, indicating that the theory supports the principle under specific conditions; N stands for neutral, meaning the theory neither supports nor opposes the principle, and A stands for against- when the theory opposes the principle.

Ethical Theory	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	K1	K2	K3	S1
Utilitarianism	C	C	C	C	C	D	D	C	C	C	C	C	C	C
Deontological Ethics	D	C	C	C	C	D	D	D	D	D	D	D	D	D
Virtue Ethics	D	C	C	D	D	D	D	D	D	D	D	D	D	D
Ethics of Care	D	C	C	D	D	D	D	D	D	D	D	D	D	D
Rights-Based Ethics	D	N	N	C	C	D	D	D	D	D	D	D	D	D
Social Contract Theory	D	C	C	N	C	C	C	C	C	C	C	C	C	C
Rawlsian Justice	D	C	C	N	C	C	C	C	C	C	C	C	C	C
Natural Law Theory	D	C	C	C	D	D	D	D	D	D	D	D	D	D
Environmental Ethics	I	I	I	D	D	D	D	I	N	N	N	N	N	N
Pragmatism	C	C	C	C	C	D	C	C	C	C	C	C	C	C

Table 1 Summary of Ethical Theories and Their Support for Principles Part 1

Ethical Theory	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
Utilitarianism	C	C	C	C	C	C	C	C	C	C	C	C	C
Deontological Ethics	D	D	D	D	D	D	D	D	D	D	D	D	D
Virtue Ethics	D	D	D	D	D	D	D	D	D	D	D	D	D
Ethics of Care	D	D	D	D	D	D	D	D	D	D	D	D	D
Rights-Based Ethics	D	D	D	D	D	D	D	D	D	D	D	D	D
Social Contract Theory	C	C	C	C	C	C	C	C	C	C	C	C	C
Rawlsian Justice	C	C	C	C	C	C	C	C	C	C	C	D	C
Natural Law Theory	D	D	D	D	D	D	D	D	D	D	D	D	D
Environmental Ethics	N	N	N	N	N	N	N	N	N	N	N	N	N
Pragmatism	C	C	C	C	C	C	C	C	C	C	C	C	C

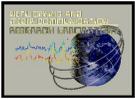
Table 2 Summary of Ethical Theories and Their Support for Principles Part 2



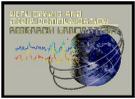
4. The Evaluation Justification for the Evaluations from the Ethical Theories

The tables below provides briefly the reasons explaining the support level for the principles.

Ethical Theory	H 1	H1 Reasoning	H 2	H2 Reasoning	H 3	H3 Reasoning	H 4	H4 Reasoning
Utilitarianism	C	Conditionally supports the principle if avoiding harm to individuals maximizes overall happiness or minimizes harm to the majority.	C	Conditionally supports the principle if protecting the organization benefits the majority or maximizes societal well-being.	C	Conditionally supports the principle if protecting infrastructure minimizes harm and benefits the majority by ensuring system reliability.	C	Conditionally supports the principle if avoiding harm to animals maximizes overall well-being or minimizes suffering for humans and animals.
Deontological Ethics	D	Directly supports the principle, as it aligns with the moral duty to respect the dignity and safety of all individuals.	C	Conditionally supports the principle if avoiding harm to the organization aligns with moral duties like fairness or honoring agreements.	C	Conditionally supports the principle if maintaining infrastructure aligns with the duty to ensure fairness and reliability in system operation.	C	Conditionally supports the principle if moral duties (such as treating them humanely) are recognized within ethical guidelines.
Virtue Ethics	D	Directly supports the principle, as it reflects virtues like compassion, care, and responsibility toward others.	C	Conditionally supports the principle if protecting the organization reflects responsibility and loyalty, but only if the organization acts ethically.	C	Conditionally supports the principle if preserving infrastructure reflects responsibility and prudence, but only if the infrastructure serves ethical purposes.	D	Directly supports the principle, as compassion and care toward animals reflect virtuous traits.
Ethics of Care	D	Directly supports the principle, emphasizing empathy and	C	Conditionally supports the principle if the organization	C	Conditionally supports the principle if safeguarding infrastructure	D	Directly supports the principle by emphasizing empathy and



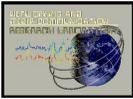
		the importance of prioritizing the well-being of all individuals.		contributes to societal care and well-being, requiring protection.		ensures the well-being of individuals or groups who rely on the system.		care for animals, particularly for vulnerable or sentient creatures.
Rights-Based Ethics	D	Directly supports the principle, as individuals have an inherent right to safety and protection from harm.	N	Neutral, as this theory primarily focuses on protecting individual rights rather than entities like organizations.	N	Neutral, as this theory focuses on individual rights and does not directly address the protection of infrastructure.	C	Conditionally supports the principle if animals are granted intrinsic rights or if harm to animals indirectly affects human rights.
Social Contract Theory	D	Directly supports the principle, as societal agreements are built on mutual protection and avoidance of harm.	C	Conditionally supports the principle if societal agreements recognize the value of protecting organizations that serve the public good.	C	Conditionally supports the principle if societal agreements recognize the importance of maintaining infrastructure for mutual benefit.	N	Neutral, as this theory traditionally applies to agreements between humans and does not inherently extend to animals.
Rawlsian Justice	D	Directly supports the principle, as ensuring fairness and equality requires protecting all individuals from harm.	C	Conditionally supports the principle if protecting the organization ensures fairness or does not disproportionately harm individuals.	C	Conditionally supports the principle if protecting infrastructure ensures fairness, particularly for those dependent on the system.	N	Neutral, as it primarily focuses on fairness and equality among humans, with limited direct consideration for animals.
Natural Law Theory	D	Directly supports the principle, as avoiding harm aligns with universal moral laws and respect for human dignity.	C	Conditionally supports the principle if avoiding harm to the organization aligns with moral order and societal benefit.	C	Conditionally supports the principle if preserving infrastructure aligns with the moral order and promotes societal stability.	C	Conditionally supports the principle if avoiding harm to animals aligns with the natural moral order or the preservation of life.
Environmental Ethics	I	Indirectly supports the	I	Indirectly supports the	I	Indirectly supports the	D	Directly supports the



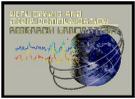
		principle, as protecting individuals can overlap with protecting the environment when human health is involved.		principle if the organization operates sustainably and does not harm the environment.		principle if protecting infrastructure helps prevent harm to the environment or ecological systems.		principle, as harm to animals disrupts ecosystems and diminishes biodiversity.
Pragmatism	C	Conditionally supports the principle if avoiding harm to individuals is practical and leads to effective outcomes.	C	Conditionally supports the principle if protecting the organization leads to practical and effective societal outcomes.	C	Conditionally supports the principle if maintaining infrastructure is practical and leads to effective societal outcomes.	C	Conditionally supports the principle if avoiding harm to animals leads to practical benefits, such as ecological balance or societal values.

Table 3 Summary of Ethical Theories and Their Reasoning to Support Principles Part 1

Ethical Theory	H 5	H5 Reasoning	H 6	H6 Reasoning	H 7	H7 Reasoning	H 8	H8 Reasoning
Utilitarianism	C	Conditionally supports the principle if avoiding harm to the environment maximizes overall happiness or reduces harm to humans and ecosystems.	D	Directly supports the principle, as mitigating harm aligns with maximizing overall happiness and minimizing suffering.	D	Directly supports the principle, as disclosing harm potential helps stakeholders make informed decisions that maximize overall happiness and minimize harm.	C	Conditionally supports the principle if intentional harm typically leads to worse overall consequences due to its deliberate nature.
Deontological Ethics	C	Conditionally supports the principle if environmental protection aligns with duties such as preserving resources for future generations.	D	Directly supports the principle, as it is the moral duty of the designer to act responsibly and avoid causing harm.	D	Directly supports the principle, as transparency and honesty are moral duties, regardless of the consequences.	D	Directly supports the principle, as intentional harm violates moral duties more explicitly than unintentional harm.



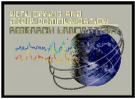
Virtue Ethics	D	Directly supports the principle by emphasizing virtues like responsibility, care, and stewardship of the environment.	D	Directly supports the principle, as taking responsibility to mitigate harm reflects virtues like integrity, prudence, and care.	D	Directly supports the principle, as disclosing harm reflects virtues like honesty, integrity, and accountability.	D	Directly supports the principle, as intentional harm reflects a lack of virtuous traits like compassion and responsibility.
Ethics of Care	D	Directly supports the principle, as protecting the environment reflects empathy and care for future generations and all life forms.	D	Directly supports the principle by emphasizing the designer's empathy and responsibility to minimize harm to users and stakeholders.	D	Directly supports the principle, as it demonstrates care, empathy, and respect for those potentially affected by the harm.	D	Directly supports the principle, as intentional harm contradicts empathy and care, which are central to this framework.
Rights-Based Ethics	C	Conditionally supports the principle if environmental harm infringes on the rights of individuals or communities to health and safety.	D	Directly supports the principle, as mitigating harm ensures the protection of individual rights to safety and well-being.	D	Directly supports the principle, as individuals have a right to know about risks that might affect their safety or well-being.	D	Directly supports the principle, as intentional harm constitutes a clear violation of individual rights, while unintentional harm may not involve intent.
Social Contract Theory	C	Conditionally supports the principle if societal agreements recognize environmental protection as essential for mutual benefit.	C	Conditionally supports the principle if societal norms and agreements recognize the designer's responsibility to mitigate harm for mutual benefit.	C	Conditionally supports the principle if societal norms or agreements require transparency about harm for mutual benefit.	C	Conditionally supports the principle if societal agreements distinguish between intentional and unintentional harm to maintain trust.
Rawlsian Justice	C	Conditionally supports the principle if protecting the environment ensures	C	Conditionally supports the principle if mitigating harm ensures fairness and	C	Conditionally supports the principle if disclosing harm ensures fairness,	C	Conditionally supports the principle if intentional harm disproportion



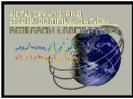
		fairness, especially for future generations or disadvantaged groups.		protects the least advantaged.		especially for vulnerable populations.		ately affects fairness and undermines protections for vulnerable groups.
Natural Law Theory	D	Directly supports the principle, as protecting the environment aligns with the natural moral order and the preservation of life.	D	Directly supports the principle, as taking steps to mitigate harm aligns with the moral order to preserve life and dignity.	D	Directly supports the principle, as truthfulness and preventing harm align with natural moral laws and respect for human dignity.	D	Directly supports the principle, as intentional harm violates the natural moral order more explicitly than unintentional harm.
Environmental Ethics	D	Directly supports the principle, as environmental protection is its core focus, emphasizing ecosystems' intrinsic value and sustainability.	D	Directly supports the principle, especially if harm mitigation includes protecting ecosystems and biodiversity.	D	Directly supports the principle, as disclosing harm to the environment helps protect ecosystems and biodiversity.	I	Indirectly supports the principle, as intentional harm to ecosystems is often seen as more unethical, but unintentional harm is also significant.
Pragmatism	C	Conditionally supports the principle if avoiding environmental harm leads to practical and effective solutions for societal and ecological well-being.	D	Directly supports the principle, as mitigating harm is a practical and effective approach to ensure system integrity and societal trust.	C	Conditionally supports the principle if disclosing harm leads to practical and effective harm reduction.	C	Conditionally supports the principle if distinguishing between intentional and unintentional harm leads to better outcomes or harm prevention.

Table 4 Summary of Ethical Theories and Their Reasoning to Support Principles Part 2

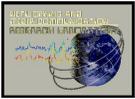
Ethical Theory	H 9	H9 Reasoning	H 10	H10 Reasoning	K 1	K1 Reasoning	K 2	K2 Reasoning
Utilitarianism	C	Conditionally supports the principle if allowing individuals to	C	Conditionally supports the principle if avoiding automated	C	Conditionally supports the principle if acquiring data ethically	C	Conditionally supports the principle if adhering to the owner's



		restrict their data usage maximizes overall societal trust and well-being.		decision-making leads to better outcomes for society or minimizes harm to individuals.		maximizes societal trust and minimizes harm.		distribution rights maximizes overall societal trust and minimizes harm.
Deontological Ethics	D	Directly supports the principle, as it aligns with the moral duty to respect individual autonomy and consent.	D	Directly supports the principle, as it aligns with the moral duty to respect individual autonomy and ensure decisions are just and fair.	D	Directly supports the principle, as it aligns with the moral duty to respect ownership and avoid theft.	D	Directly supports the principle, as respecting distribution rights aligns with the moral duty to honor agreements and rules.
Virtue Ethics	D	Directly supports the principle, as respecting an individual's control over their data reflects virtues like integrity and responsibility.	D	Directly supports the principle, as avoiding automatic decisions reflects responsibility, fairness, and respect for the individual.	D	Directly supports the principle, as acquiring data ethically reflects virtues like honesty and integrity.	D	Directly supports the principle, as following distribution rights demonstrates virtues like honesty, integrity, and fairness.
Ethics of Care	D	Directly supports the principle, as it demonstrates care and respect for the individual's preferences and privacy.	D	Directly supports the principle, emphasizing empathy and understanding that individuals deserve a personalized approach, not impersonal automation.	D	Directly supports the principle, as respecting ownership demonstrates care and empathy toward the data owner.	D	Directly supports the principle, as respecting distribution rights reflects care and empathy for the data owner's intentions and preferences.
Rights-Based Ethics	D	Directly supports the principle, as individuals have an inherent right	D	Directly supports the principle, as individuals have the right to	D	Directly supports the principle, as individuals have a fundamental	D	Directly supports the principle, as individuals have an inherent right



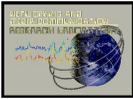
		to control how their personal data is used.		challenge decisions and ensure human oversight in matters affecting them.		right to control their own data and how it is shared.		to control how their data is distributed and used.
Social Contract Theory	C	Conditionally supports the principle if societal agreements prioritize individual rights to data privacy and consent.	C	Conditionally supports the principle if societal agreements prioritize the right to human involvement in decision-making processes.	C	Conditionally supports the principle if societal norms recognize and enforce respect for data ownership.	C	Conditionally supports the principle if societal norms and agreements emphasize the importance of adhering to distribution rights.
Rawlsian Justice	C	Conditionally supports the principle if ensuring this right promotes fairness, particularly for vulnerable or disadvantaged groups.	C	Conditionally supports the principle if it prevents unjust outcomes, particularly for disadvantaged individuals.	C	Conditionally supports the principle if acquiring data ethically promotes fairness and does not disproportionately harm the disadvantaged.	C	Conditionally supports the principle if respecting distribution rights ensures fairness and prevents harm to vulnerable or disadvantaged groups.
Natural Law Theory	D	Directly supports the principle, as respecting individual autonomy and privacy aligns with natural moral laws and human dignity.	D	Directly supports the principle, as relying on human judgment aligns with moral and natural laws that prioritize fairness and dignity.	D	Directly supports the principle, as theft violates natural moral laws and the ethical order of respecting property rights.	D	Directly supports the principle, as adhering to agreed distribution rights aligns with natural moral laws of respecting ownership and fairness.
Environmental Ethics	N	Neutral, as this theory primarily focuses on ecological concerns and does not directly	N	Neutral, as this theory focuses on ecological issues and does not address decision-	N	Neutral, as this theory focuses on ecological issues and does not address personal data	N	Neutral, as this theory focuses on ecological issues and does not directly address data



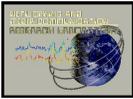
		address personal data rights.		making rights directly.		ownership directly.		distribution rights.
Pragmatism	C	Conditionally supports the principle if allowing individuals to opt out leads to practical solutions, such as greater trust and reduced harm.	C	Conditionally supports the principle if human decision-making produces better outcomes or mitigates harm effectively.	C	Conditionally supports the principle if acquiring data ethically leads to practical and effective outcomes while minimizing risks.	C	Conditionally supports the principle if respecting distribution rights leads to practical and effective outcomes, such as increased trust and legal compliance.

Table 5 Summary of Ethical Theories and Their Reasoning to Support Principles Part 3

Ethical Theory	K3	K3 Reasoning	S1	S1 Reasoning	S2	S2 Reasoning	S3	S3 Reasoning
Utilitarianism	C	Conditionally supports the principle if upholding the data subject's rights maximizes overall trust, societal welfare, and minimizes harm.	C	Conditionally supports the principle if transparency increases trust and minimizes harm to individuals and society.	C	Conditionally supports the principle if transparency about the process improves societal trust, minimizes harm, and maximizes utility.	C	Conditionally supports the principle if adhering to authorized purposes minimizes harm and maximizes trust and societal well-being.
Deontological Ethics	D	Directly supports the principle, as it is a moral duty to respect and uphold the rights of the data subject.	D	Directly supports the principle, as it aligns with the moral duty to respect autonomy and ensure informed consent.	D	Directly supports the principle, as respecting an individual's right to know aligns with the moral duty of honesty and informed consent.	D	Directly supports the principle, as it aligns with the moral duty to respect consent and agreements made with the subject.
Virtue Ethics	D	Directly supports the principle, as respecting the data subject's rights reflects virtues like fairness,	D	Directly supports the principle, as transparency reflects virtues like honesty, fairness, and integrity.	D	Directly supports the principle, as transparency reflects virtues like integrity, accountability, and fairness.	D	Directly supports the principle, as using data only for authorized purposes reflects virtues like



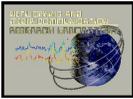
		honesty, and responsibility.				integrity, responsibility, and fairness.		
Ethics of Care	D	Directly supports the principle, as it demonstrates empathy, care, and respect for the individual whose data is being handled.	D	Directly supports the principle, as informing individuals about data collection demonstrates empathy and respect for their autonomy.	D	Directly supports the principle, as providing clarity about the data collection process demonstrates care, empathy, and respect for the individual.	D	Directly supports the principle, as respecting the subject's authorization demonstrates empathy, care, and respect for their autonomy.
Rights-Based Ethics	D	Directly supports the principle, as individuals have inherent rights over their personal data, which the owner is obligated to uphold.	D	Directly supports the principle, as individuals have a fundamental right to know how their personal data is collected and used.	D	Directly supports the principle, as individuals have an inherent right to understand how their personal data is collected and handled.	D	Directly supports the principle, as individuals have a right to control how their data is used, including restricting unauthorized purposes.
Social Contract Theory	C	Conditionally supports the principle if societal agreements emphasize the importance of protecting data subject rights.	C	Conditionally supports the principle if societal norms or agreements prioritize transparency and accountability in data collection.	C	Conditionally supports the principle if societal norms and agreements emphasize the need for transparency in data collection processes.	C	Conditionally supports the principle if societal norms and agreements prioritize respecting the subject's consent in data usage.
Rawlsian Justice	C	Conditionally supports the principle if upholding the data subject's rights ensures fairness and protects vulnerable or disadvantaged groups.	C	Conditionally supports the principle if informing individuals ensures fairness and prevents exploitation, especially of vulnerable groups.	C	Conditionally supports the principle if knowing the process ensures fairness and prevents exploitation, especially for disadvantaged individuals.	C	Conditionally supports the principle if restricting unauthorized use ensures fairness and protects vulnerable individuals.



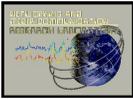
Natural Law Theory	D	Directly supports the principle, as respecting the rights of individuals aligns with the natural moral law and human dignity.	D	Directly supports the principle, as respecting an individual's right to know aligns with natural moral laws and dignity.	D	Directly supports the principle, as understanding the data collection process aligns with natural moral laws of respecting autonomy and dignity.	D	Directly supports the principle, as adhering to authorized purposes respects the subject's autonomy and aligns with natural moral laws.
Environmental Ethics	N	Neutral, as this theory focuses on ecological issues and does not directly address data subject rights.	N	Neutral, as this theory focuses on ecological issues and does not directly address data collection and transparency.	N	Neutral, as this theory focuses on ecological issues and does not directly address individual data rights or processes.	N	Neutral, as this theory focuses on ecological issues and does not directly address individual data rights or usage.
Pragmatism	C	Conditionally supports the principle if upholding the data subject's rights leads to practical and effective societal outcomes, such as trust or harm reduction.	C	Conditionally supports the principle if ensuring transparency leads to practical benefits like increased trust and reduced harm.	C	Conditionally supports the principle if explaining the data collection process leads to practical benefits like trust-building and harm prevention.	C	Conditionally supports the principle if restricting unauthorized use leads to practical benefits, such as trust-building and harm reduction.

Table 6 Summary of Ethical Theories and Their Reasoning to Support Principles Part 4

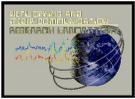
Ethical Theory	S 4	S4 Reasoning	S 5	S5 Reasoning	S 6	S6 Reasoning	S 7	S7 Reasoning
Utilitarianism	C	Conditionally supports the principle if informing individuals promptly enhances trust, minimizes harm, and maximizes societal well-being.	C	Conditionally supports the principle if allowing withdrawal enhances societal trust and reduces potential harm to the individual or others.	C	Conditionally supports the principle if allowing access to data promotes trust, minimizes harm, and maximizes societal benefit.	C	Conditionally supports the principle if correcting wrong information minimizes harm and maximizes trust and societal well-being.
Deontological Ethics	D	Directly supports the	D	Directly supports the	D	Directly supports the	D	Directly supports the



		principle, as it aligns with the moral duty to respect autonomy and ensure transparency in data use.		principle, as it aligns with the moral duty to respect an individual's autonomy and their right to control their data.		principle, as it aligns with the moral duty to ensure transparency and respect individual autonomy over their personal data.		principle, as it aligns with the moral duty to ensure accuracy and respect for individuals' autonomy and integrity.
Virtue Ethics	D	Directly supports the principle, as informing individuals promptly reflects virtues like honesty, integrity, and responsibility.	D	Directly supports the principle, as respecting the individual's decision to withdraw permission reflects virtues like integrity, responsibility, and fairness.	D	Directly supports the principle, as providing data in a readable format reflects virtues like fairness, integrity, and accountability.	D	Directly supports the principle, as ensuring correct information reflects virtues like honesty, fairness, and responsibility.
Ethics of Care	D	Directly supports the principle, as it demonstrates empathy, care, and respect for the individual's right to make informed decisions.	D	Directly supports the principle, as it emphasizes care and empathy for individuals who may wish to change their decisions about data usage.	D	Directly supports the principle, as it demonstrates care and empathy by empowering individuals with control and understanding of their personal data.	D	Directly supports the principle, as it demonstrates care and empathy by allowing individuals to correct inaccuracies that may harm them.
Rights-Based Ethics	D	Directly supports the principle, as individuals have an inherent right to control their data and be informed about changes to its use.	D	Directly supports the principle, as individuals have a fundamental right to revoke consent and control how their data is used.	D	Directly supports the principle, as individuals have a fundamental right to access and control their personal data in an accessible format.	D	Directly supports the principle, as individuals have a fundamental right to correct inaccurate data that pertains to them.
Social Contract Theory	C	Conditionally supports the principle if societal norms and agreements	C	Conditionally supports the principle if societal agreements	C	Conditionally supports the principle if societal norms or	C	Conditionally supports the principle if societal norms



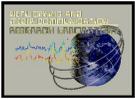
		prioritize transparency and respect for data subject rights.		prioritize the individual's right to withdraw consent for data usage.		agreements recognize data accessibility as a shared expectation or entitlement.		recognize the obligation to provide individuals with the right to correct errors in their data.
Rawlsian Justice	C	Conditionally supports the principle if ensuring this right promotes fairness and protects vulnerable or disadvantaged individuals.	C	Conditionally supports the principle if allowing withdrawal promotes fairness and protects vulnerable individuals from potential misuse of their data.	C	Conditionally supports the principle if ensuring data accessibility promotes fairness and reduces inequality, particularly for disadvantaged individuals.	C	Conditionally supports the principle if ensuring data accuracy promotes fairness and reduces inequality, particularly for those affected by inaccuracies.
Natural Law Theory	D	Directly supports the principle, as respecting an individual's right to know aligns with natural moral laws and human dignity.	D	Directly supports the principle, as honoring the withdrawal of consent aligns with moral laws emphasizing respect for human dignity and autonomy.	D	Directly supports the principle, as enabling individuals to access their data aligns with moral laws emphasizing respect for human dignity and autonomy.	D	Directly supports the principle, as correcting inaccuracies aligns with moral laws emphasizing truth and respect for human dignity.
Environmental Ethics	N	Neutral, as this theory focuses on ecological issues and does not directly address data usage or consent.	N	Neutral, as this theory does not directly address individual rights regarding personal data.	N	Neutral, as this theory focuses on ecological issues and does not address individual data access rights.	N	Neutral, as this theory focuses on ecological issues and does not address individual data accuracy rights.
Pragmatism	C	Conditionally supports the principle if promptly informing individuals about changes in data use	C	Conditionally supports the principle if permitting withdrawal of permission leads to practical	C	Conditionally supports the principle if providing data access in readable formats leads to practical	C	Conditionally supports the principle if correcting inaccuracies leads to practical benefits like



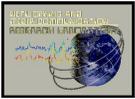
		leads to practical benefits like trust and harm reduction.		benefits like increased trust and reduced harm.		benefits, such as trust-building and accountability		harm reduction and increased trust.
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Table 7 Summary of Ethical Theories and Their Reasoning to Support Principles Part 5

Ethical Theory	S 8	S8 Reasoning	S 9	S9 Reasoning	S 10	S10 Reasoning	S 11	S11 Reasoning
Utilitarianism	C	Conditionally supports the principle if erasing data prevents harm, protects societal trust, and leads to greater well-being.	C	Conditionally supports the principle if allowing restriction and opt-out minimizes harm and maximizes societal trust and well-being.	C	Conditionally supports the principle if avoiding automated decision-making leads to better societal outcomes or minimizes harm.	C	Conditionally supports the principle if avoiding the use of individuals for AI training prevents harm or promotes societal trust.
Deontological Ethics	D	Directly supports the principle, as it aligns with the moral duty to respect autonomy and individual consent over data use.	D	Directly supports the principle, as it aligns with the moral duty to respect individual autonomy and consent in data handling.	D	Directly supports the principle, as it aligns with the moral duty to respect human autonomy and accountability in decisions.	D	Directly supports the principle, as it aligns with the moral duty to respect individual consent and autonomy.
Virtue Ethics	D	Directly supports the principle, as honoring the right to be forgotten demonstrates virtues like fairness, respect, and responsibility.	D	Directly supports the principle, as allowing restriction and opt-out demonstrates virtues like integrity, responsibility, and fairness.	D	Directly supports the principle, as avoiding automated decisions reflects responsibility, fairness, and respect for human dignity.	D	Directly supports the principle, as refraining from using individuals for AI training without consent reflects virtues like fairness and respect.



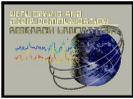
Ethics of Care	D	Directly supports the principle, as it reflects empathy and respect for the individual's right to privacy and control over their data.	D	Directly supports the principle, as it reflects care and empathy for individuals who wish to have control over their data.	D	Directly supports the principle, as it emphasizes empathy and the need for personal consideration in decisions affecting individuals.	D	Directly supports the principle, as it emphasizes empathy and respect for the autonomy and dignity of individuals.
Rights-Based Ethics	D	Directly supports the principle, as individuals have a fundamental right to request the erasure of their personal data.	D	Directly supports the principle, as individuals have an inherent right to restrict the use and distribution of their personal data.	D	Directly supports the principle, as individuals have a right to challenge decisions and ensure human oversight.	D	Directly supports the principle, as individuals have a fundamental right to control how their data and identity are used.
Social Contract Theory	C	Conditionally supports the principle if societal norms recognize the right to be forgotten as part of collective agreements on privacy.	C	Conditionally supports the principle if societal agreements and norms prioritize individual rights to control their data.	C	Conditionally supports the principle if societal agreements value human involvement in decision-making processes.	C	Conditionally supports the principle if societal agreements uphold individuals' rights to opt out of being used for AI training.
Rawlsian Justice	C	Conditionally supports the principle if allowing erasure ensures fairness and protects vulnerable individuals from potential misuse of their data.	C	Conditionally supports the principle if allowing restriction and opt-out ensures fairness and protects vulnerable individuals.	C	Conditionally supports the principle if avoiding automated decisions promotes fairness and protects	C	Conditionally supports the principle if allowing individuals to opt out ensures fairness, especially for marginalized or vulnerable groups.



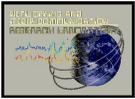
					disadvantaged groups.			
Natural Law Theory	D	Directly supports the principle, as respecting an individual's request for erasure aligns with natural moral laws and human dignity.	D	Directly supports the principle, as it aligns with moral laws emphasizing respect for autonomy and individual dignity.	D	Directly supports the principle, as relying on human judgment aligns with natural moral laws and human dignity.	D	Directly supports the principle, as it respects the moral laws of individual dignity and consent.
Environmental Ethics	N	Neutral, as this theory focuses on ecological issues and does not address personal data rights.	N	Neutral, as this theory focuses on ecological concerns and does not directly address personal data rights or processing.	N	Neutral, as this theory does not address issues related to personal decision-making processes.	N	Neutral, as this theory focuses on ecological concerns and does not address issues of personal data use for AI.
Pragmatism	C	Conditionally supports the principle if erasure of data leads to practical benefits like harm reduction and increased trust.	C	Conditionally supports the principle if allowing restriction and opt-out leads to practical benefits such as trust-building and harm reduction.	C	Conditionally supports the principle if avoiding automated decision-making leads to practical and fairer outcomes.	C	Conditionally supports the principle if respecting this right leads to practical benefits such as increased trust and ethical AI development.

Table 8 Summary of Ethical Theories and Their Reasoning to Support Principles Part 6

Ethical Theory	S12	S12 Reasoning	S13	S13 Reasoning	S14	S14 Reasoning
Utilitarianism	C	Conditionally supports the principle if restricting data sales reduces harm, protects societal trust, and ensures the well-being of individuals.	C	Conditionally supports the principle if avoiding discrimination for exercising data rights leads to greater societal trust and minimizes harm.	C	Conditionally supports the principle if compensating individuals for the commercial use of their data minimizes harm and maximizes societal trust and fairness.
Deontological Ethics	D	Directly supports the principle, as it	D	Directly supports the principle, as it	D	Directly supports the principle, as it aligns

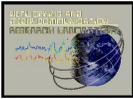


		aligns with the moral duty to respect individual consent and autonomy over data usage.		aligns with the moral duty to treat all individuals equally and respect their rights without penalizing them.		with the moral duty to respect individuals' ownership and fairness in data monetization.
Virtue Ethics	D	Directly supports the principle, as restricting unauthorized data sales reflects virtues like fairness, honesty, and responsibility.	D	Directly supports the principle, as treating individuals fairly regardless of their data choices reflects virtues like justice, fairness, and integrity.	D	Directly supports the principle, as compensating individuals reflects virtues like justice, fairness, and respect for others' contributions.
Ethics of Care	D	Directly supports the principle, as it demonstrates care, empathy, and respect for individuals' privacy and autonomy.	D	Directly supports the principle, as it demonstrates empathy and respect for individuals by ensuring no harm comes to them for exercising their rights.	D	Directly supports the principle, as it demonstrates empathy and fairness toward individuals whose data is being monetized.
Rights-Based Ethics	D	Directly supports the principle, as individuals have a fundamental right to control how their data is used, including restricting its sale.	D	Directly supports the principle, as individuals have a fundamental right to exercise their data rights without fear of discrimination.	D	Directly supports the principle, as individuals have the right to benefit from their own data when it is used for commercial purposes.
Social Contract Theory	C	Conditionally supports the principle if societal agreements prioritize protecting individuals' privacy and rights over data transactions.	C	Conditionally supports the principle if societal agreements recognize and enforce the equal treatment of individuals exercising their rights.	C	Conditionally supports the principle if societal agreements recognize individuals' entitlement to compensation for the use of their data.
Rawlsian Justice	C	Conditionally supports the principle if restricting data sales ensures	D	Directly supports the principle, as ensuring equal treatment for exercising rights	C	Conditionally supports the principle if compensating individuals for their data promotes



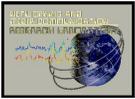
		fairness and prevents harm to vulnerable or disadvantaged individuals.		promotes fairness and protects the least advantaged individuals.		fairness and reduces inequality, especially for disadvantaged groups.
Natural Law Theory	D	Directly supports the principle, as it respects moral laws emphasizing individual autonomy and consent.	D	Directly supports the principle, as avoiding discrimination respects moral laws emphasizing human dignity and equality.	D	Directly supports the principle, as it aligns with the moral laws of respecting ownership and the fair distribution of resources.
Environmental Ethics	N	Neutral, as this theory focuses on ecological concerns and does not address personal data rights or transactions.	N	Neutral, as this theory does not address individual rights or discriminatory practices related to data usage.	N	Neutral, as this theory focuses on ecological issues and does not address personal data monetization or compensation.
Pragmatism	C	Conditionally supports the principle if restricting unauthorized data sales leads to practical benefits like increased trust and ethical data usage.	C	Conditionally supports the principle if ensuring non-discrimination leads to practical benefits such as societal trust and fairness in services.	C	Conditionally supports the principle if compensating individuals leads to practical benefits, such as trust-building and ethical commercial practices.

Table 9 Summary of Ethical Theories and Their Reasoning to Support Principles Part 7



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