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BEYOND DATA: HUMAN RIGHTS, ETHICAL AND SOCIAL IMPACT ASSESSMENTS IN AI

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< I >

HRIA in AI-powered machines

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Case study: a story of machines and kids

- ✓ Key elements
  - Role of playing and role-playing in kids' education
  - Emotional interaction with anthropomorphic dolls
  - Dialogue as a channel to suggest behavioral patterns, collect personal information, convey values

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Phase I: Planning and scoping

- Used technology
  - NLP: speech recognition technology
  - AI-based interaction (more than 8,000 lines of dialogue)
  - Cloud-based
  - Data processing (voice-recording tracks)

- Device features
  - Microphone and speakers
  - Wi-Fi connection

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- Right-holders
  - Direct users (minors)
  - Supervisory users (parents, partial remote control)
  - Third parties (e.g. friends of the user or re-users of the doll)

- Main purposes
  - Play
  - Educational
  - Others (limited parental control, testing and service improvement)

- Duty-bearers
  - Manufacturer
  - Third-party service providers (e.g., ML, cloud)

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Phase II: Initial risk analysis and assessment

Mitigation of evident high-risks

- Interaction and data collection
  - Activation process
  - Push-and-hold button
  - Element (doll's necklace) which light up when the device is active
- AI-based NLP
  - Pre-selected dataset of possible answerers
  - No search on Internet

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Risk analysis and assessment

- Use of a questionnaire to support the impact assessment
- Potentially impacted rights
  - Data protection and the right to privacy (dialogues, parental monitoring)
  - Freedom of thought, parental guidance and the best interest of the child (behavioural, cultural and educational influence)
  - Right to psychological and physical safety (cyberattacks, data theft, transmission of inappropriate content, safety)

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Tab. 2 Probability

	Probability	
Low	The risk of prejudice is improbable or highly improbable	1
Medium	The risk may occur	2
High	There is a high probability that the risk occurs	3
Very high	The risk is highly likely to occur	4

Tab. 3 Exposure

	Exposure	
Low	Few or very few of the identified population of rights-holders are potentially affected	1
Medium	Some of the identified population are potentially affected	2
High	The majority of the identified population is potentially affected	3
Very high	Almost the entire identified population is potentially affected	4

Tab. 4 Likelihood table(L)

		Probability			
		1	2	3	4
Exposure	1	1	2	3	4
	2	2	3	5	9
	3	3	5	9	12
	4	4	7	12	15

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Data protection and the right to privacy

- Likelihood of prejudice
  - Risk factors: companion toy, dialogue recording, largely unsupervised interaction, potential data sharing by parents
  - Probability: high
  - Risk factors: all the doll's users are potentially exposed to this risk
  - Exposure: very high
  - Likelihood of prejudice: very high

Tab. 4 Gravity of the prejudice

	Gravity of the prejudice	
Low	Affected individuals and groups may encounter only minor prejudices in the exercise of their rights and freedoms.	1
Medium	Affected individuals and groups may encounter significant prejudices.	2
High	Affected individuals and groups may encounter serious prejudices.	3
Very high	Affected individuals and groups may encounter serious or even irreversible prejudices.	4

Tab. 5 Effort to overcome the prejudice and to reverse adverse effects.

	Effort	
Low	Suffered prejudice can be overcome without any problem (e.g. time spent amending information, annoyances, irritations, etc.)	1
Medium	Suffered prejudice can be overcome despite a few difficulties (e.g. extra costs, fear, lack of understanding, stress, minor physical ailments, etc.).	2
High	Suffered prejudice can be overcome albeit with serious difficulties (e.g. economic loss, property damage, worsening of health, etc.).	3
Very high	Suffered prejudice may not be overcome (e.g. long-term psychological or physical ailments, death, etc.).	4

Tab. 6 Severity table (S)

		Gravity			
		1	2	3	4
Effort	1	1	2	4	6
	2	2	3	5	8
	3	3	5	8	10
	4	5	8	10	12

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- Severity
  - Risk factors: subjects involved (young children and minors), processing of personal data in several areas, sensitive information, unexpected findings, transborder data flows
  - Gravity of the prejudice: high
  - Risk factors: potential parental supervision and remote control, data security measures (e.g. data erasure, dialogue with the minor in case of unexpected findings).
  - Effort to overcome potential prejudice/to reverse adverse effects: medium
  - Severity: medium

Tab. 8. Overall risk impact table

		Severity [impacted right/freedom]			
		Low	Medium	High	Very high
Likelihood	Low				
	Medium				
	High				
	Very high				

- If the likelihood of prejudice can be considered very high and the severity medium, the overall impact is high

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Freedom of thought, parental guidance and the best interest of the child

- Likelihood: medium
  - Risk factors: limited number of value-oriented statement (e.g., “It’s so cool that you want to be a mom someday”)
  - Probability: medium
  - Risk factors: values commonly accepted in the target cultural context (including value-oriented notion of inappropriate questions)
  - Exposure: medium
- Severity: low
  - Risk factors: not particularly controversial value-laden sentences
  - Gravity of prejudice: low
  - Risk factors: talking with children can mitigate potential harm
  - Effort: low
- Overall impact: medium

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Right to psychological and physical safety

- Likelihood: low
  - Risk factors: limited interest in malicious attacks (e.g., harassment, stalking, insults, confidence loss, bullying), but easy access to the toy
  - Probability: medium
  - Risk factors: use of the toy mainly in safe environment
  - Exposure: low
- Severity: medium
  - Risk factors: young age of the users, attacks only through verbal instructions
  - Gravity of prejudice: medium
  - Risk factors: parent-child dialogue and technical solutions can combat the potential prejudice
  - Effort: medium
- Overall impact: medium

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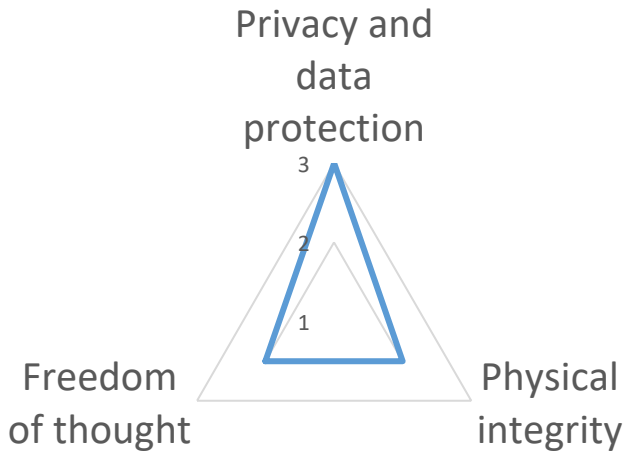
Results of the Initial Assessment

Risk	L	S	Overall impact
Impact on privacy and data protection	VH	M	H
Impact on freedom of thought	M	L	M
Impact on the right to psychological and physical safety	L	M	M



1 Low impact

2 Medium impact

3 High impact

Phase III: Mitigation measures and re-assessment

- Data protection and the right to privacy
  - Default setting: deliberate action to activate AI-based information processing/dialogue functions
  - Unexpected content: accurate selection of conversation topics (closed set of sentences, possibility for parents to modify phrases/questions), policy for unexpected findings
  - Content: no conversation monitoring, invidividual testing phases only in a laboratory setting, possibility for parents to delete stored information
  - Data security: stronger authentication and encryption solutions

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Exposure: reduced to low (prejudices only in special circumstances, e.g. malicious attack)
Probability: reduced to low (reduction of risk relating to data collection/retention)
Likelihood: reduced to low

Gravity: lowered to medium (mitigation measures)
Effort: it remains medium (risk of hacking)
Severity: lowered somewhat, though remaining medium

Overall impact: lowered from high to medium

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- Freedom of thought, parental guidance and the best interest of the child
  - NLP: pre-set database, no Internet, content fine-tuned to the education level of the user
  - Transparency: visualisation of embedded values (logic and content maps)
  - Values/content: user-customisable (critical topics), stereotype prevention by default
  - Design team: diversity

  Exposure: no change, medium (variety of cultural contexts, need for an active role of parents)
  Probability: lowered to low (product design and customization)
  Likelihood: lowered to low

  Severity: no change, low (now more responsible content management)

  Overall impact: lowered from medium to low

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- Right to psychological and physical safety
  - Risk of malicious hacking activities: exclusion of interaction with other IoT devices, strong authentication and data encryption

  Exposure: no change (low)
  Probability: reduced to low (protection measures adopted)
  Likelihood: it remains low but is lowered

  Gravity: no impact (medium)
  Effort: no impact (medium)
  Severity: it remains medium

  Overall impact: no change, medium (malicious hacking is the most critical aspect)

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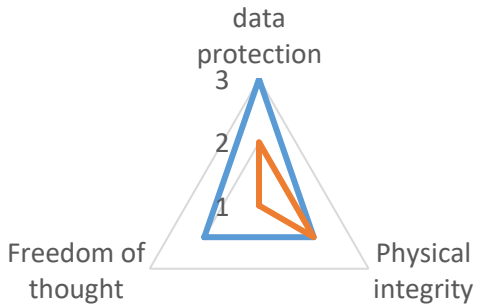
- Assessment (effects of measures adopted)

Risk	L	S	Overall impact	MMs	rL	rS	Final impact
Impact on privacy and data protection	VH	M	H	Yes	M	M	M
Impact on freedom of thought	M	L	M	Yes	L	L	L
Impact on the right to psychological and physical safety	L	M	M	Yes	L	M	M
Overall impact (all impacted areas)			M/H				M/L



1 Low impact

2 Medium impact

3 High impact

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Ethical and Social Impact Assessments

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Results of the empirical analysis (AI companies)

- 1st group

active role of ethics committees in the companies' business (internal procedures, tasks and companies committed to taking the committees' input into account)

- 2nd group

concrete interaction and impact on company decisions not documented

- 3rd group

unknown identity of committee members, general description of the main purpose of the committees

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Available models

- Variety of structures (internal/external committees)
- Variety of tasks (guidelines, advice on specific products/services, policies, etc.)
- Key role of independence and reputation of committee members
- Tension between human rights and corporate principles/values
- Need for greater transparency about the structure and functioning, including their impact on the decision-making processes of companies
- Accountability for decisions based on committee recommendations
- Important role for internal requests (critical issues/cases) and role of internal ethics officers

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The role of expert committees in AI (HRESIA)

- Contextualisation human rights
- Integrating HRIA with respect to contextual ethical and social values (community values, acceptability and substitutability of proposed AI solutions)
- No one-size-fits-all model
- Key elements
  - Independence
  - Reputation of committee members
  - Effectiveness
  - Transparency
  - Accountability
  - Stakeholder and rightsholder engagement

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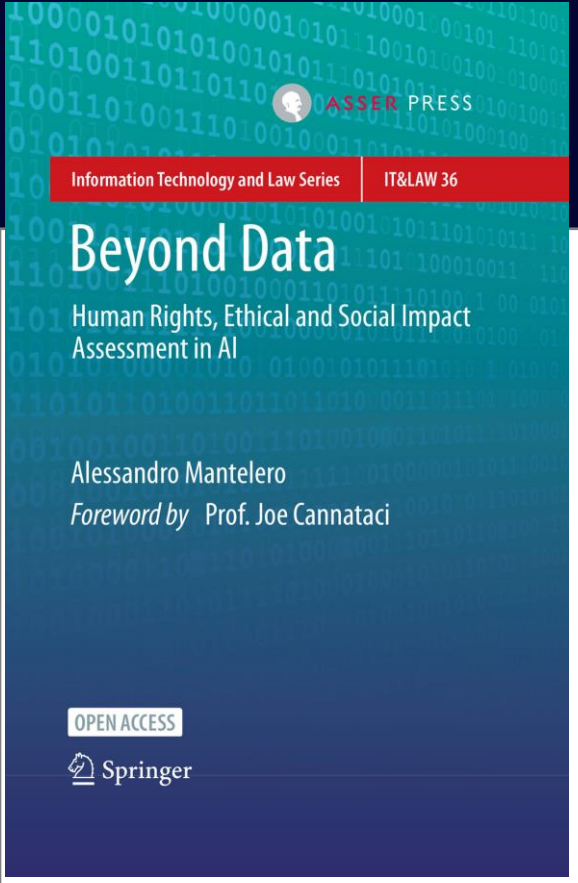

- ✓ Beyond Data : Rise and Fall of Individual Sovereignty Over Data Use
- ✓ A Paradigm Shift: The Focus on Risk Assessment
- ✓ The HRESIA model : Human Rights, Ethical, and Social Impact Assessment
- ✓ HRIA in AI
- ✓ The Social and Ethical Component in AI Systems Design
- ✓ Impact assessment in AI regulating: a missing piece
- ✓ Open Issues

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Open Access
https://link.springer.com/book/10.1007/978-94-6265-531-7


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