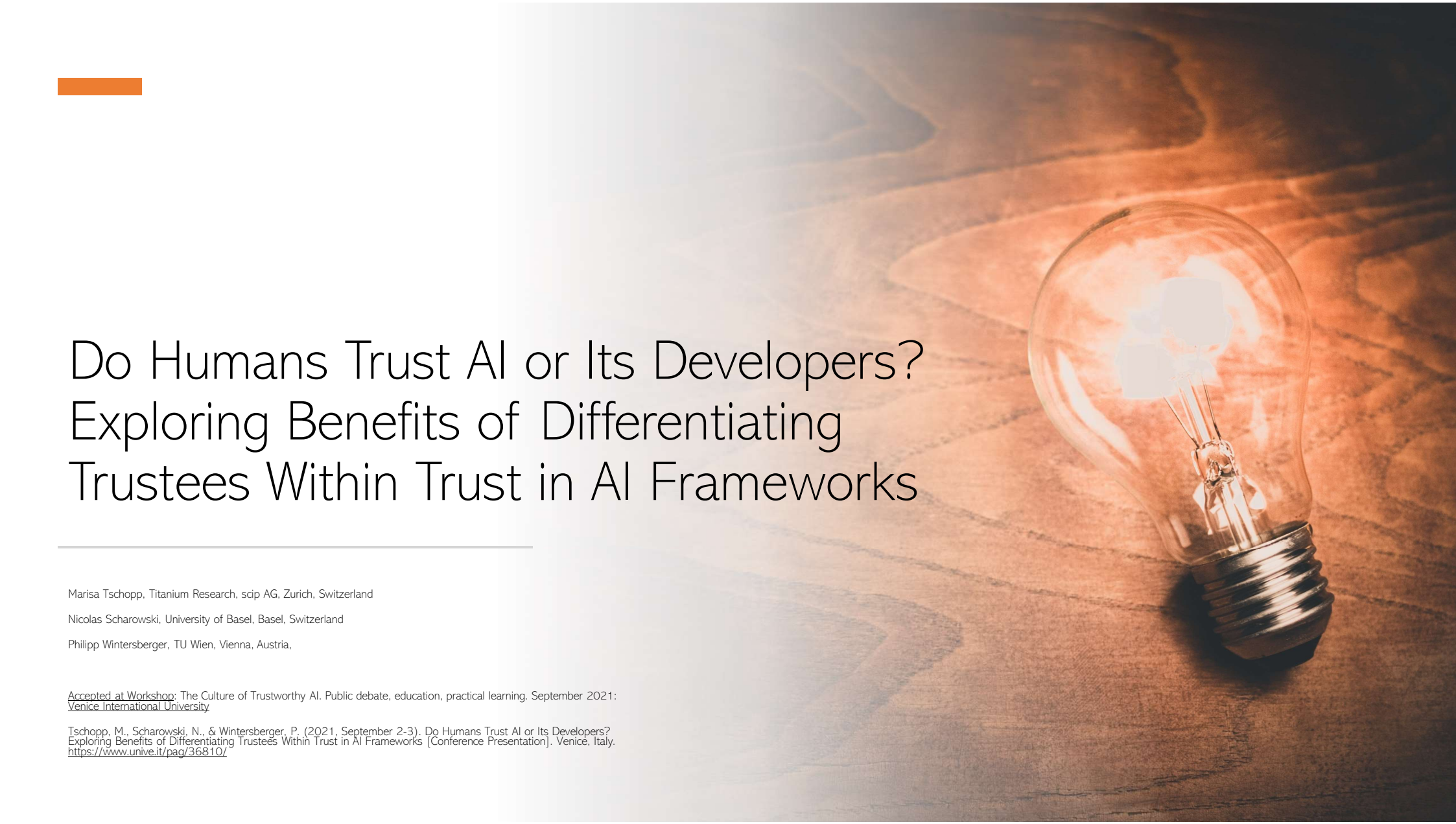
Do Humans Trust AI or Its Developers? Exploring Benefits of Differentiating Trustees Within Trust in AI Frameworks



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Introduction

AI systems should be *"understandable to non-technical audiences and providing them with meaningful information, which is necessary to evaluate fairness and gain trust"*

(Regulatory proposal 2021, European Commission)

- The words "trust" and "trustworthiness" appear over 100 times in a regulatory proposal by the European Commission → Suggesting, that trust and beneficial use have a close relationship
- Do they? "No one should Trust AI!" (Joanna Bryson, 2018)

References

*Joanna Bryson. 2018. AI & Global Governance: No One Should Trust AI. https://cpr.unu.edu/publications/articles/ai-global-governance-no-one-should-trust-ai.html

*European Commission. 2021. Proposal for a Regulation laying down harmonised rules on artificial intelligence. (2021) https://digital-strategy.ec.europa.eu/en/library/proposal-regulation-laying-down-//harmonised-rules-artificial-intelligence

Research questions

As AI systems in various contexts become part of human lives, and increasing awareness by the public, a broad understanding of how people make sense of AI as an actor is necessary [1] which cannot exclude the topic of trust. To better understand the relevance of trust, a better understanding of who and what humans place their trust "exactly" in is needed [2,3,4].

RQ 1: Is trust even relevant when it comes to user behavior? (No trust, no use?)

RQ 2: Are trust in AI and trust in tech companies of AI different dimensions?

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Method 1 / 2: Participants

- Online survey with various questions around trust/use ratings and demographic variables (date of data collection, 2019).
- Participants:
  - N = 111 between 30 and 50 (62 female, 42 male, 2 diverse, 5 did not answer) . 76% have at last a Bachelor, Master Degree or higher, and participants are primarily from western countries (72% European, 15% American, 13% other).
  - Their self-reported level of expertise in AI (M = 4.69, SD = 2.24) was slightly below, and their expertise in technology (M = 6.67, SD = 2.09) slightly above the midpoint of a 10-point Likert scale, with no significant gender-differences.

Method 2/2: Questionnaire

Scale items
General Trust in Artificial Intelligence (Cronbach's α = .71)
1 In general do you trust AI?
2 In general, are you sceptical about AI? (reverse coded)
Trust in Tech Companies (providers of AI, Cronbach's α = .81)
3 In general, do you trust the big tech companies who develop AI?
4 Tech-companies (providers of AI) are trustworthy and keep up to ethical standards
5 Tech-companies (providers of AI) care about humanity rather than their own benefit
6 Tech-companies are taking much care in building safey and high-quality AI products

- Two self developed items to measure trust in AI (5-point Likert scale)
- Four self developed items to measure trust in tech companies (5-point Likert scale)
- Acceptable Cronbach's Alpha to calculate scale means
- Intention to use was measured on a nominal scale (yes, no, depends) to stimulate a «behavioural response»:

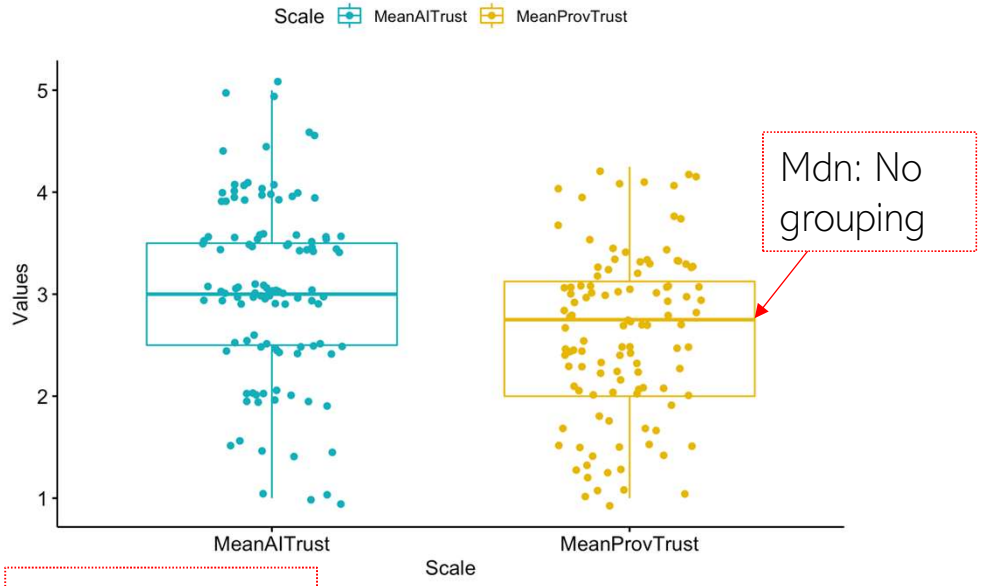
1. Would you use a self-driving car? (high risk scenario)
2. Are you using a conversational AI? (low risk scenario)

Results 1 / 4 RQ 1: No trust, no use?

Concept & Artifact	Value	N	trust in AI mdn (IQR)	trust in AI M (SD)	trust in provider mdn (IQR)	trust in provider M (S)
Use automated vehicle	yes	50	3.5 (1)	3.48 (.82)	3 (.94)	2.86 (.82)
	no	31	2.5 (1)	2.53 (.75)	2 (1.25)	2.16 (.74)
Use digital assistant	yes	43	3.5 (1)	3.38 (.84)	3 (.75)	2.88 (.80)
	no	60	3 (1)	2.87 (.81)	2.5 (1.06)	2.45 (.77)

- Normality assumptions violated (Shapiro-Wilk's test's p-values < 0.05)
- Mann-Whitney-U test shows that participants who would use an automated vehicle rated their general trust in AI significantly higher than those who would not ($z = -4.703$, $p < .001$, $d = .52$)
- Those who would use automated vehicles ($z = -3.635$, $p < .001$, $d = .40$) or use digital assistants ($z = -2.457$, $p = .013$, $d = .24$) trust technology companies significantly more than those who claimed the opposite
- No difference in trust ratings between using a car or using a digital assistant

Results 2/ 4 RQ 2: Trust in AI vs. Trust in Tech companies?



Mdn/M: grouped

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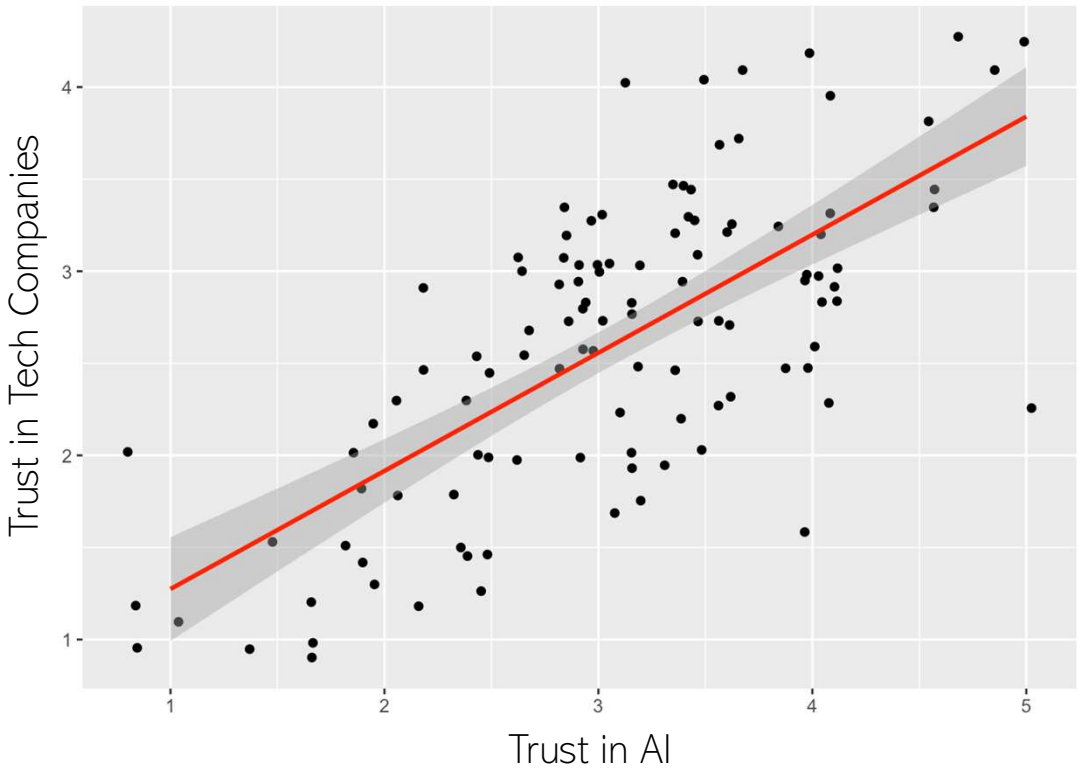
- Normality assumptions violated (Shapiro-Wilk's test's p-values < 0.05)
- The boxplots show lower ratings for the provider trust and higher ratings for trust in AI (more scattered/ higher SD)
- The median of the different scales is significantly different with an estimated difference of 0.62. (Wilcoxon z = -6.26, p = 3.899e-10, n = 111; effect size is Cohen's d = .6, medium to large)
- Similar patterns for comparing users – and not-users of AI artifacts

Results 3/3 RQ 2: Trust in AI vs. Trust in Tech companies?



- While AI trust and provider trust ratings are significantly different (as shown by the Wilcoxon test), there is a moderate correlation between the two dimensions.
- People with higher AI trust also show higher Provider trust ($r_K = .53$)
- Principle component analysis (varimax) indicates two different factors but cannot be interpreted due to low sample size.

Discussion

The pilot study suggests two main findings:

1. People are able to differentiate between trust in AI and trust in the provider. But is this influencing their behavior? So, does it even matter?

Statement of one participant: "*It is not the AI [I am skeptical about]. It is who is designing it and how it is being used behind the scene that deserves scrutiny and caution.*"

2. The "no trust, no use" hypothesis also applies in the context of AI. People who are already using or would use a conversational AI or an automated vehicle have a **higher level of trust**. But why is there no difference between the risk scenarios?

Limitations and Future Work

Limitations

- Small, convenience sample
- Tech-Savvy, well educated, culturally biased
- No investigation of particulary providers
- Self-developed items
- Use presented as self-report and not differentiated between actual use and intention to use

→Results cannot be generalized

Future work

- Diverse, validated methods and larger sample size (re-evaluate existing trust measures)
- Real product experiences with corresponing providers (e.g. Amazon and Alexa)
- Can we create a trust experiment including all trust dimensions comparable to the «moral machine experiment»?
- «Tech-Convergence»: Is trust in Alexa different than trust in an autmated vehicle or any other automated/AI technology?

Conclusion

- Debates on «who is the trustee» are still a hot topic, but impact is unclear
- Normative caveat every «trust researcher» should address: Differentiate between trust in the context of responsibility/accountability, and trust calibration in direct human-machine interactions
- Trust believers vs. Trust skeptics: We hope that thinking about the similarities between the two will allow us to develop better methodologies and products in the future

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* Bold references were selected for the extended abstract (limited number of references; We used the additional references for our short paper (unpublished). We thought these references might be useful for the readers here.