

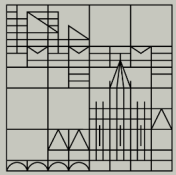
The ethics of genome editing

An empirical investigation

Benedikt Höltgen (LMU Munich) & Johannes Doerflinger (Konstanz)

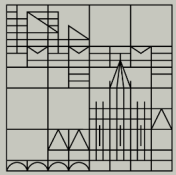
21 September 2018

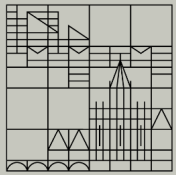




Outline

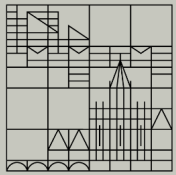
- 1) **Ethical challenges of genetic technologies**
- 2) **Study 1:** Bioethical judgments of laypeople
- 3) **Study 2:** Does moral identity determine bioethical judgments?
- 4) **Context-dependence of bioethical judgements**





Genetic revolution that can eradicate disease

- 'Jaw-dropping' breakthrough lets scientists delete faulty parts of the human genome
- Discovery has potential for treating cancer, HIV, Down's syndrome and Huntington's
- 'A triumph with huge implications for science,' declares Nobel Prize winner

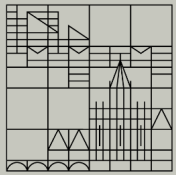


STAT

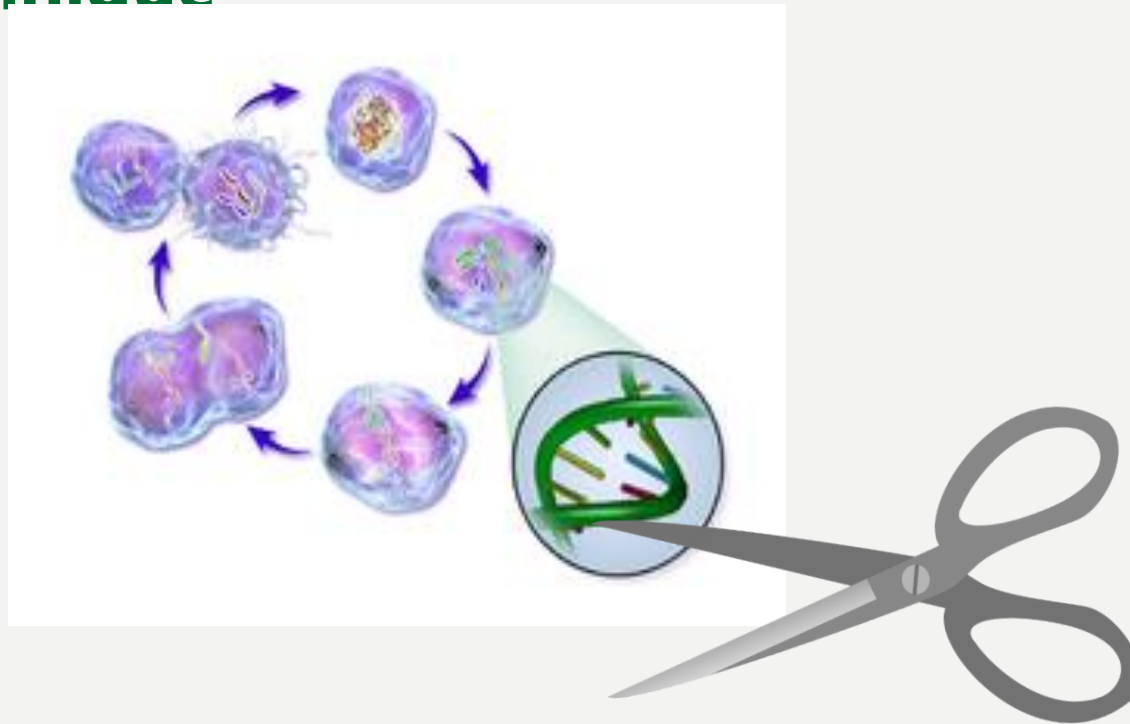
MEDICAL & BIOTECH

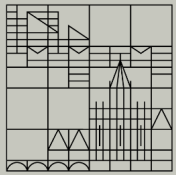
Potential DNA Damage from CRISPR “Seriously Underestimated,” Study Finds

A flurry of recent findings highlight a contentious question in this area

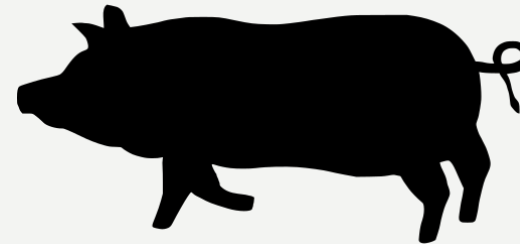
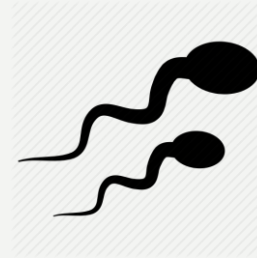


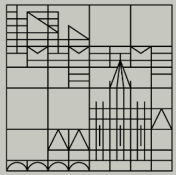
CRISPR/Cas9: new genome editing technique





Ethical issues



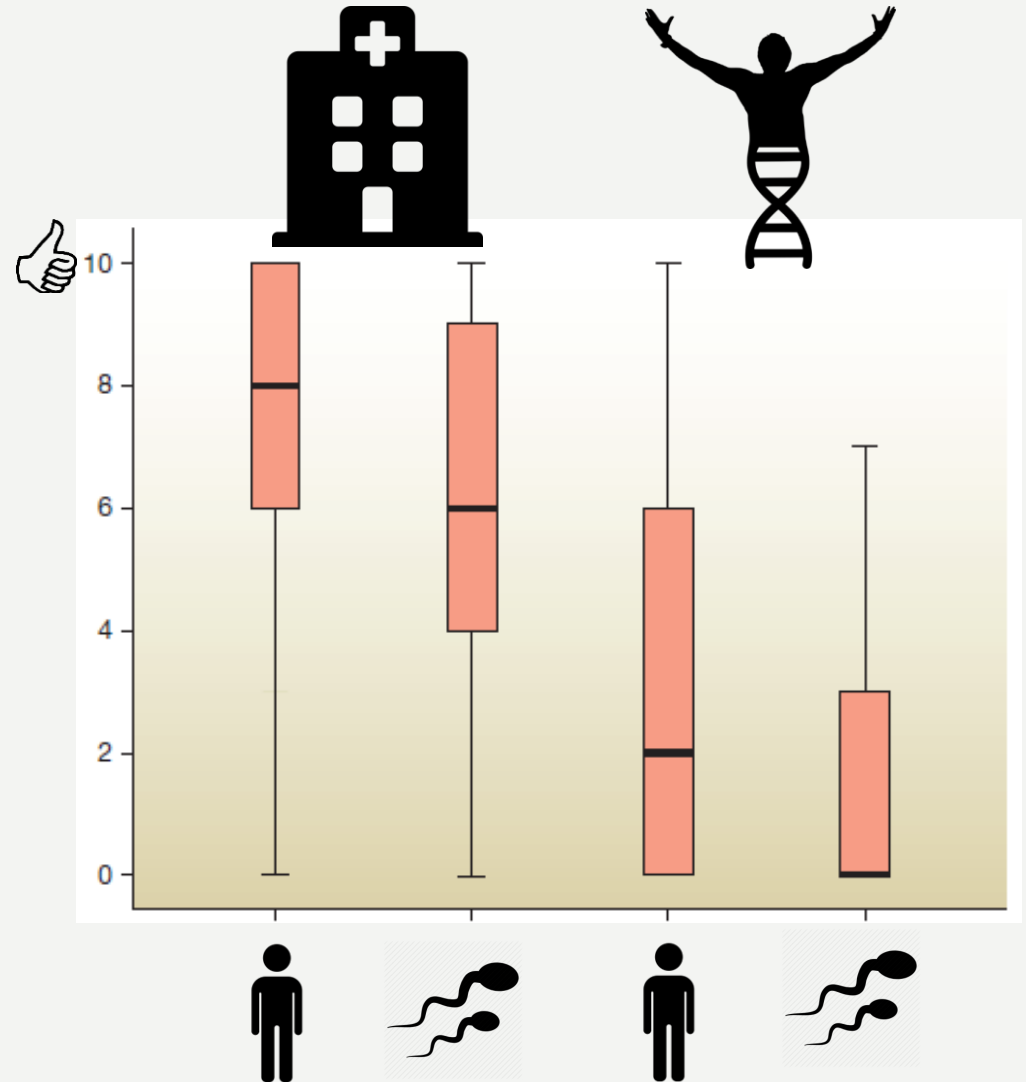


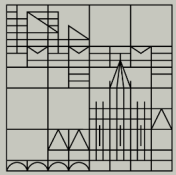
Gaskell et al. (2017)

Using genome editing...

...for therapy rather than
enhancement

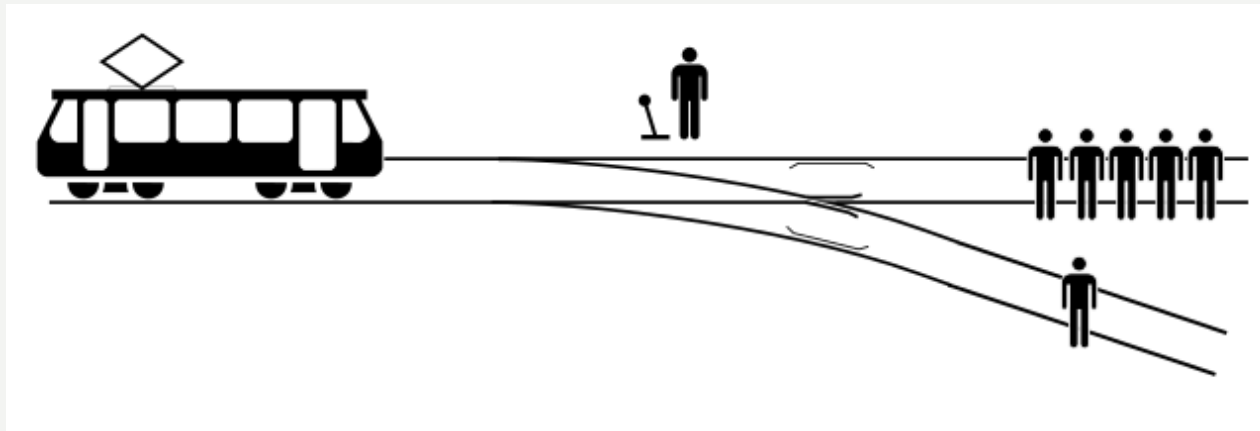
...in adults rather than in
embryos

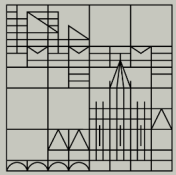




Project goals

- Investigate lay opinions on genome editing
-> generate insights for policy-makers
- Study moral judgements about issues of *applied* ethics





Team

LMU Munich

PI: Nora Heinzemann

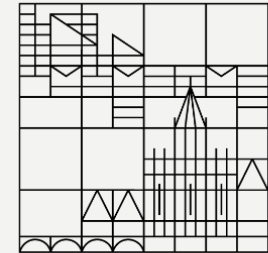
University of Konstanz

PI: Johannes Doerflinger

German Cancer Research Center Heidelberg

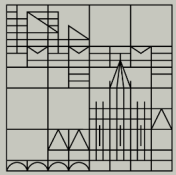


Universität
Konstanz



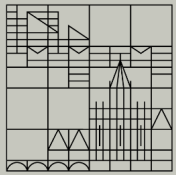
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GERMAN
CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION



Study 1: lay opinions and confidence (LMU)

- investigation of lay opinions 
- correlations with individual traits 
- confidence in opinions 
- developing a questionnaire as a measurement tool 

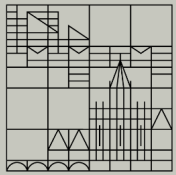


Sample

- Online survey on MTurk
- 124 participants, 79 after exclusion
- 27 female, 52 male
- mean age 36.2 years

Exclusion criterion

Failing more than one of eight attention checks



Questionnaire

16 Statements

Genetic tests are ethically impermissible even if a hereditary disease runs in a family.

16 Vignettes

Jennifer is planning to conceive a child. She knows that severe hereditary diseases run in her family.

Jennifer is ethically required to perform a genetic test prior to conception.

Responses

Strongly
agree

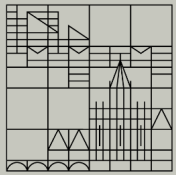
Strongly
disagree

Confidence

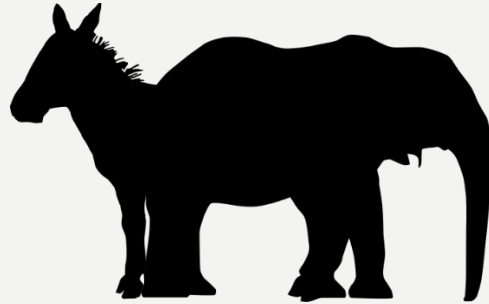
How confident are you that your decision is correct?

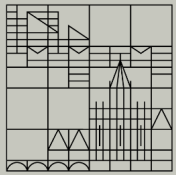
Very
confident

Not at all
confident



Personal information





Factor analysis: 23 items, 7 factors, including:

- Personalised medicine



- Reproductive medicine



- Genetic testing of humans

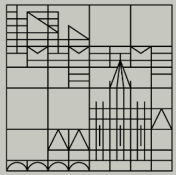


- Genetic testing of non-human animals



- Social justice

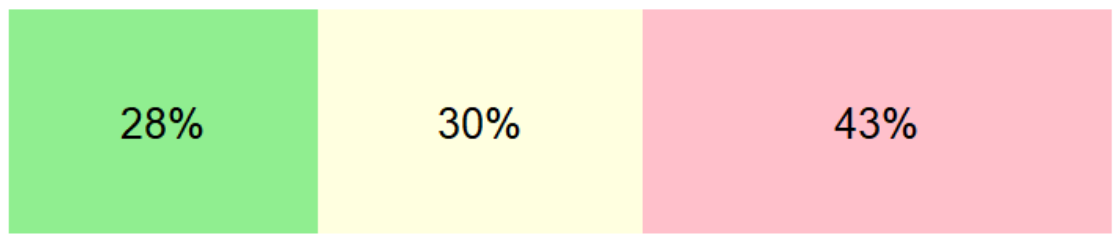




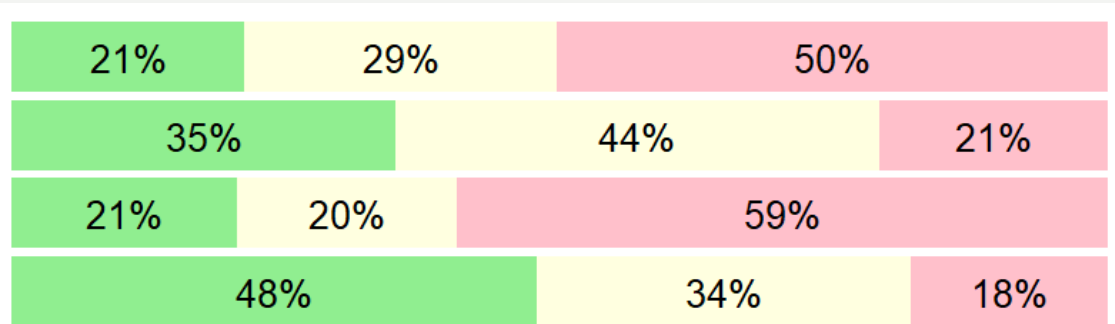
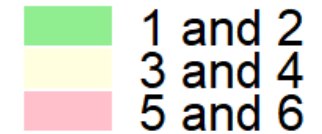
Results

How much do you approve of genetic technologies?

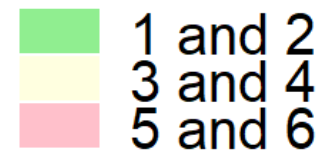
All applications



Agreement

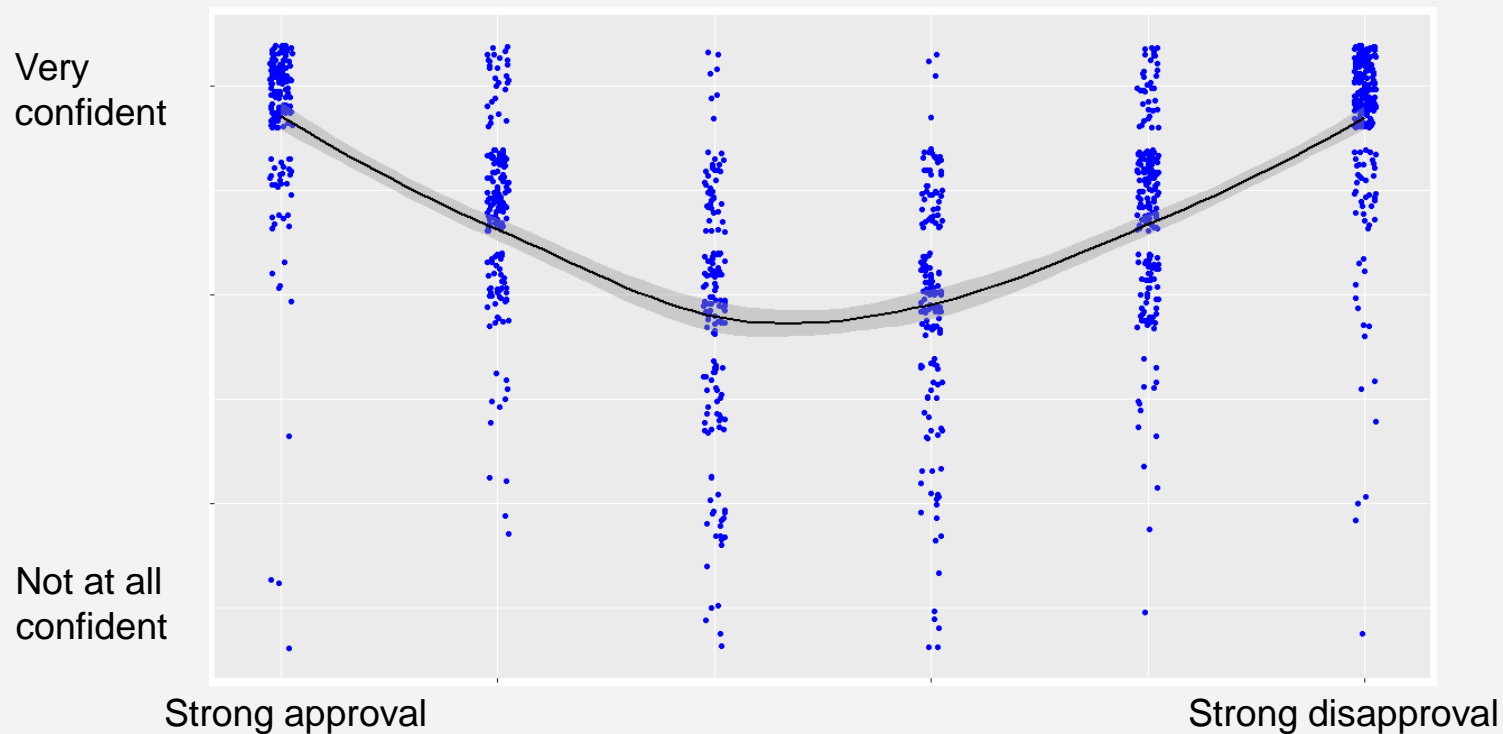


Agreement

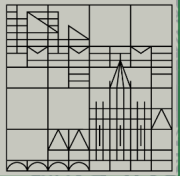




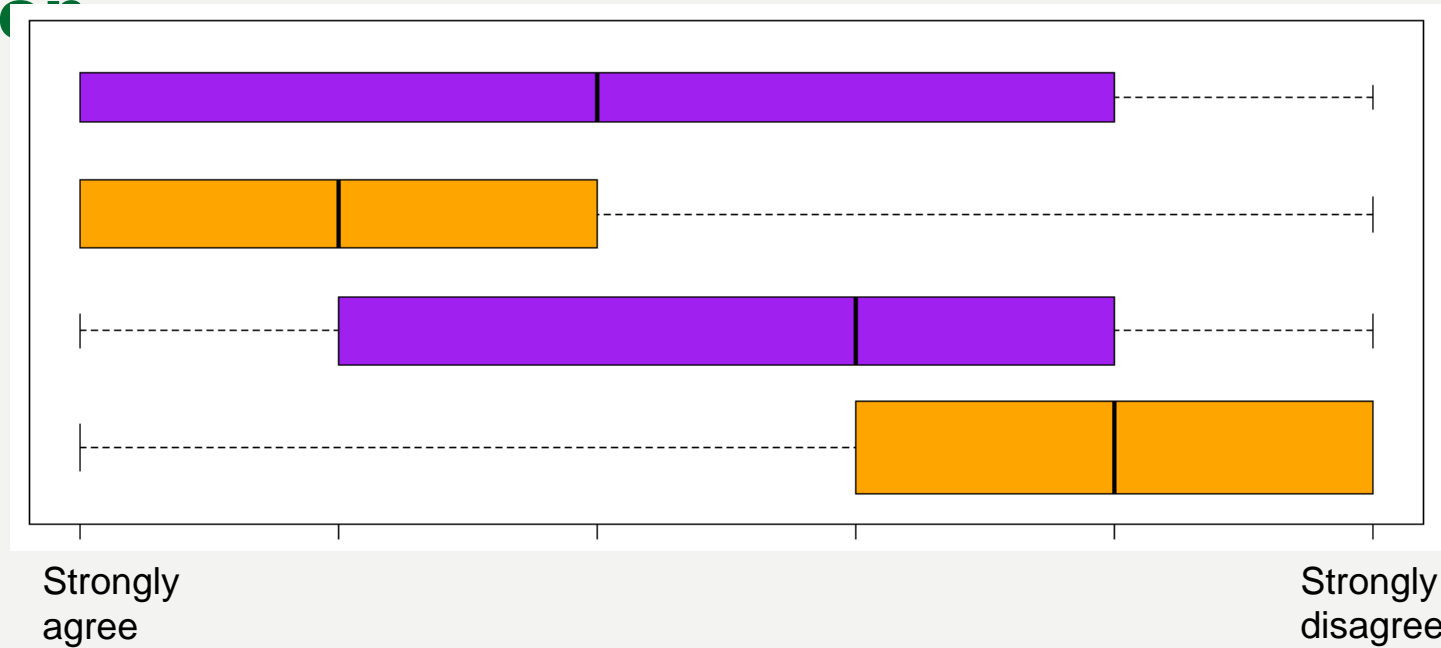
Extreme views and high confidence



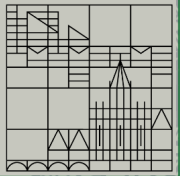
correlation significant ($p < 0.05$)



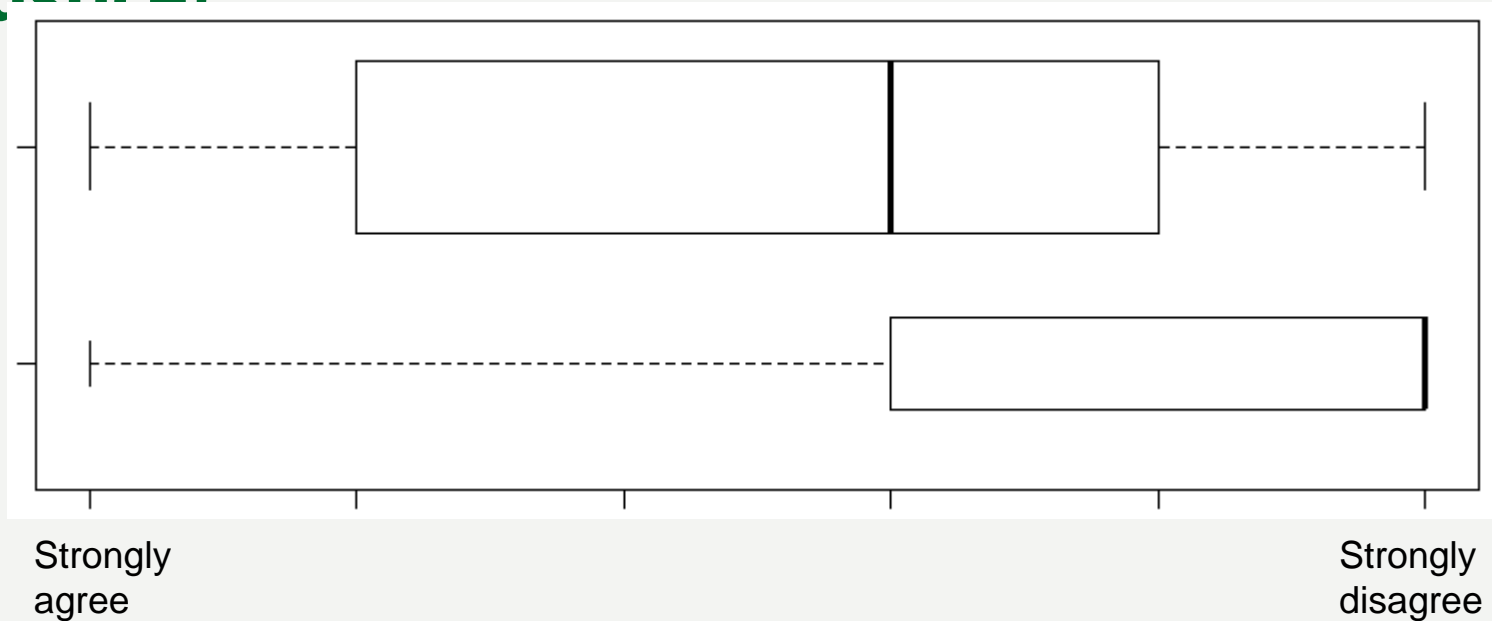
Gender: genetic tests are permissible



t-tests significant ($p < 0.05$)



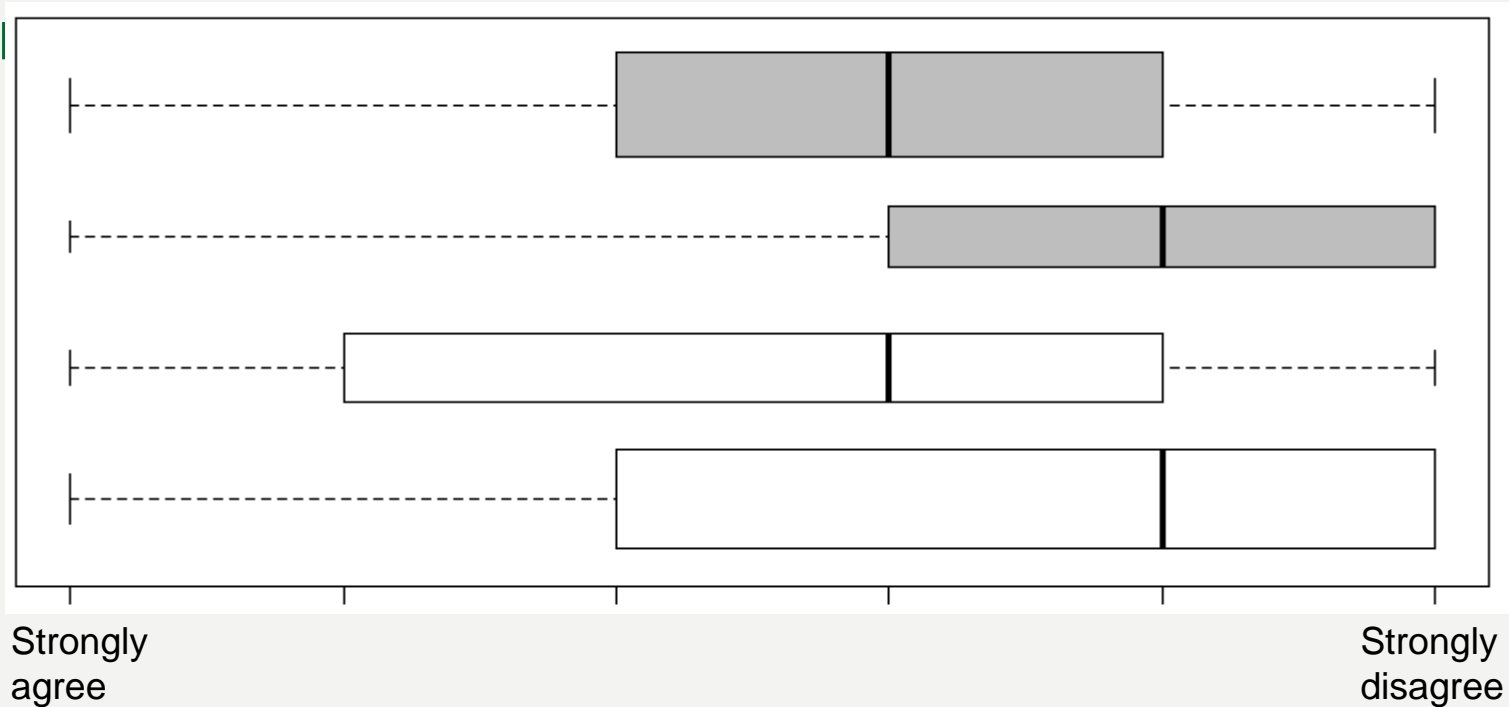
Genetic engineering an issue of social justice?



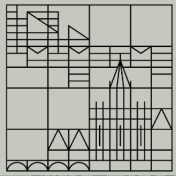
t-test significant ($p < 0.05$), 24% religious



GE permissible in reproductive

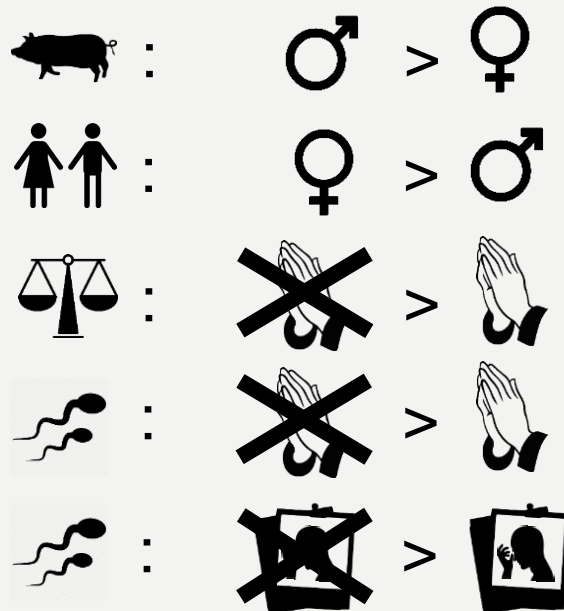


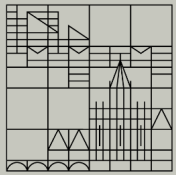
t-tests significant ($p < 0.05$), 66% had experience with cancer



Ethical opinions on genetic technologies

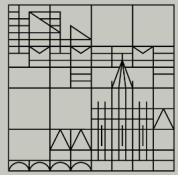
- Higher confidence for more extreme positions
- Correlations with personal traits:





Limitations

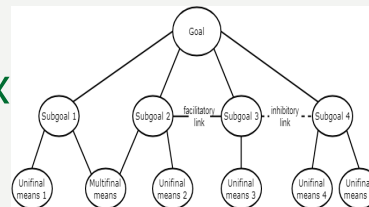
- Groups often unevenly divided → less statistical power (esp. gender and religiosity)
- Some questionnaire items did not clearly fall under one category
- Ethical expressions vary in strength

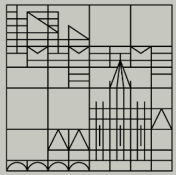


Study 2: Moral Identity (University of Konstanz)

Moral identity specifically reflects how important moral concerns are for an individuals' sense of self (Jennings et al., 2015) .

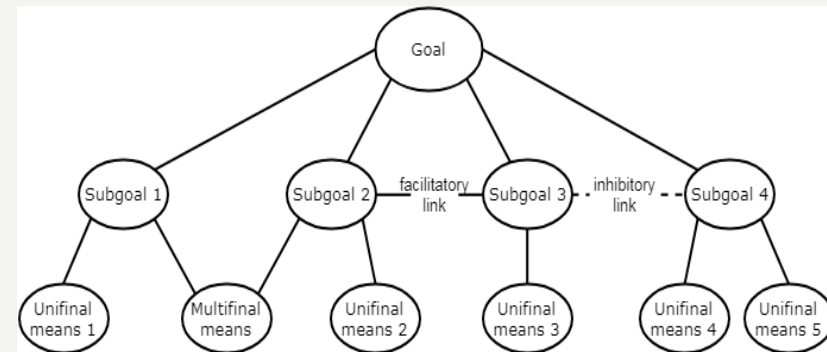
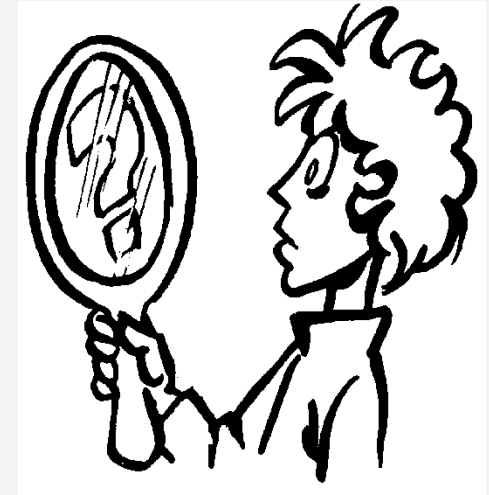
- Moral Identity as an identity goal
- Social roles and other identity goals
- Self-Complexity

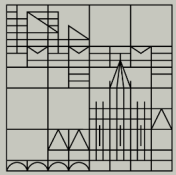




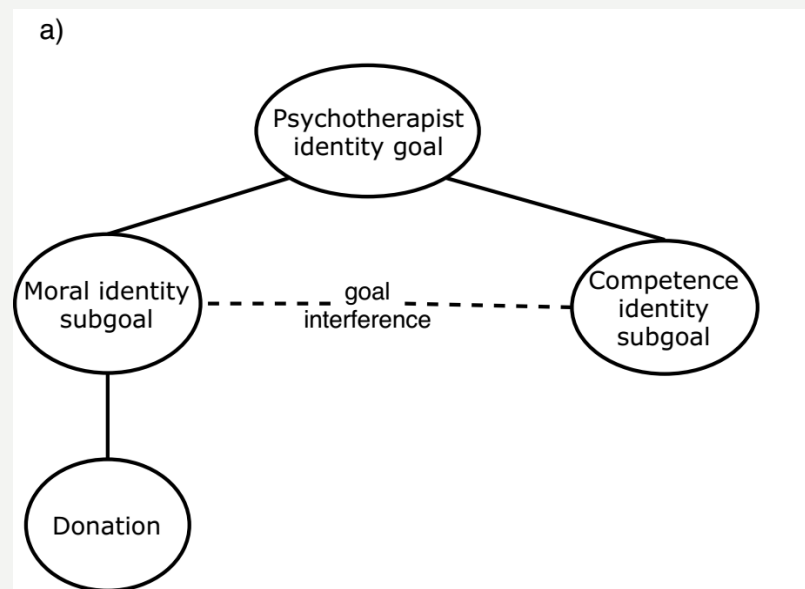
Identity Goals

- Commitment to act
- Incomplete Goals → Tension state
- Self-completion with symbols
- Goals are part of a goal system

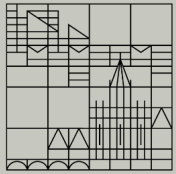




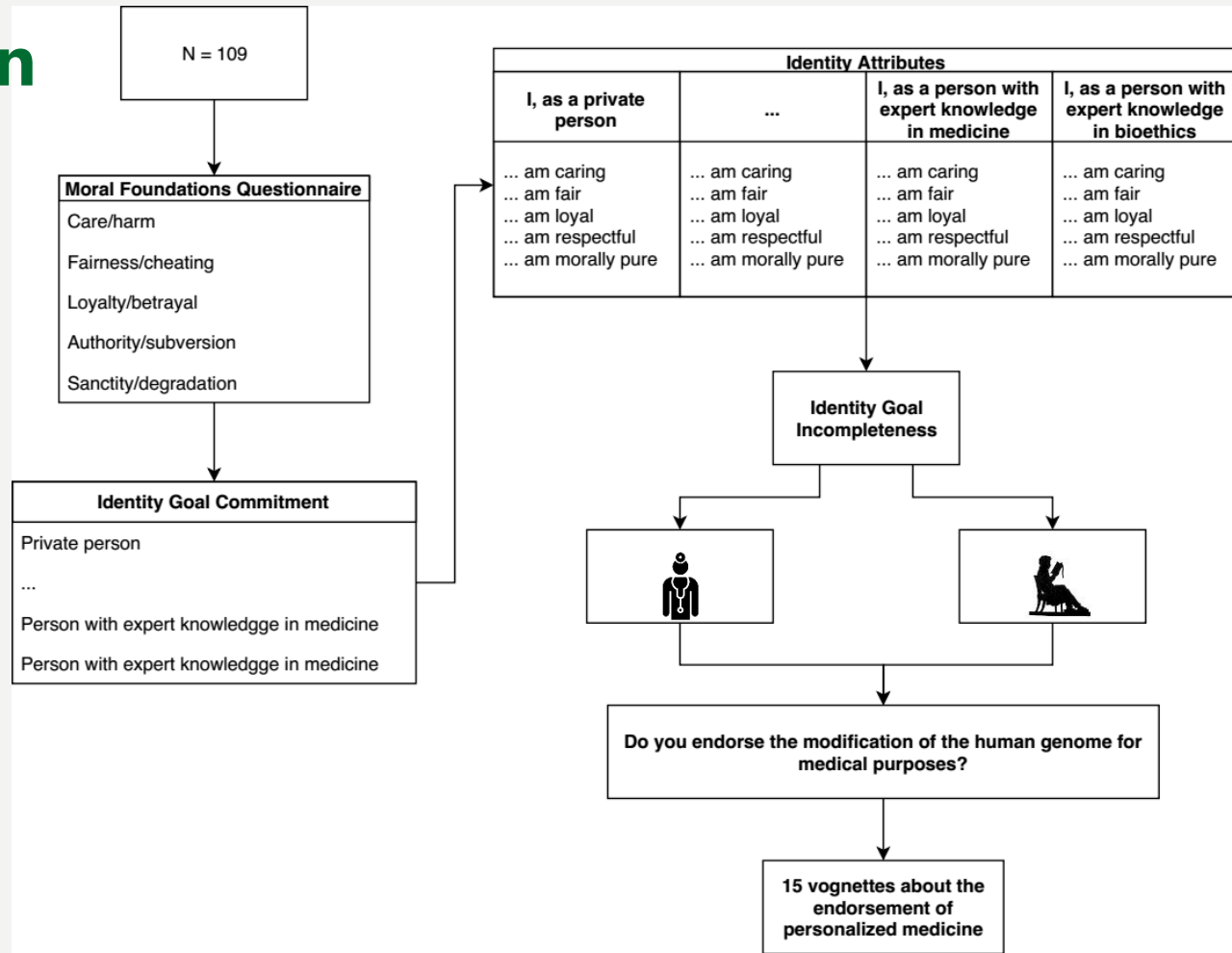
The motivational force of moral identity depends on other active identity goals

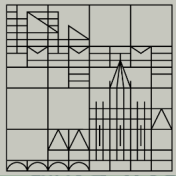


Doerflinger (2018)

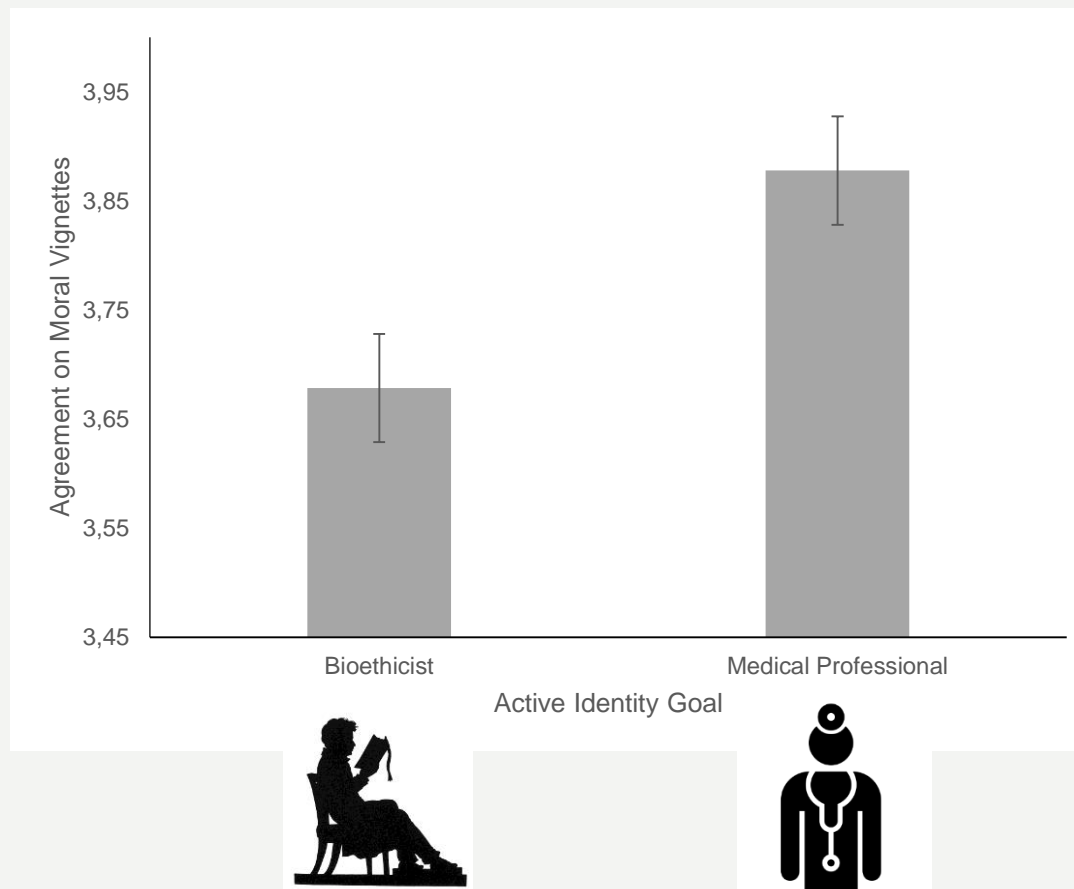


Design



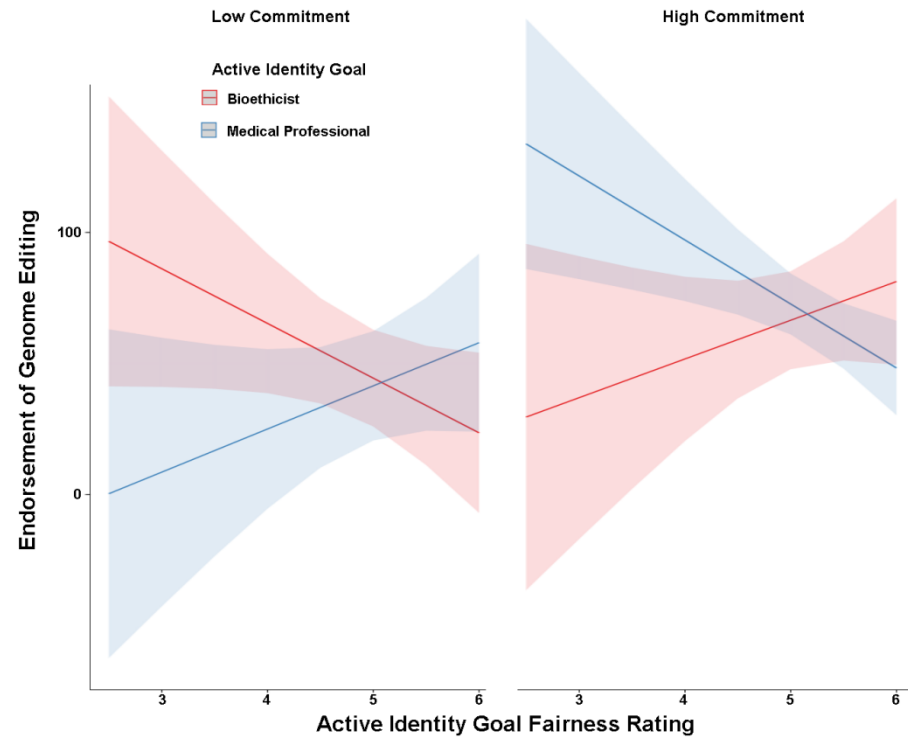
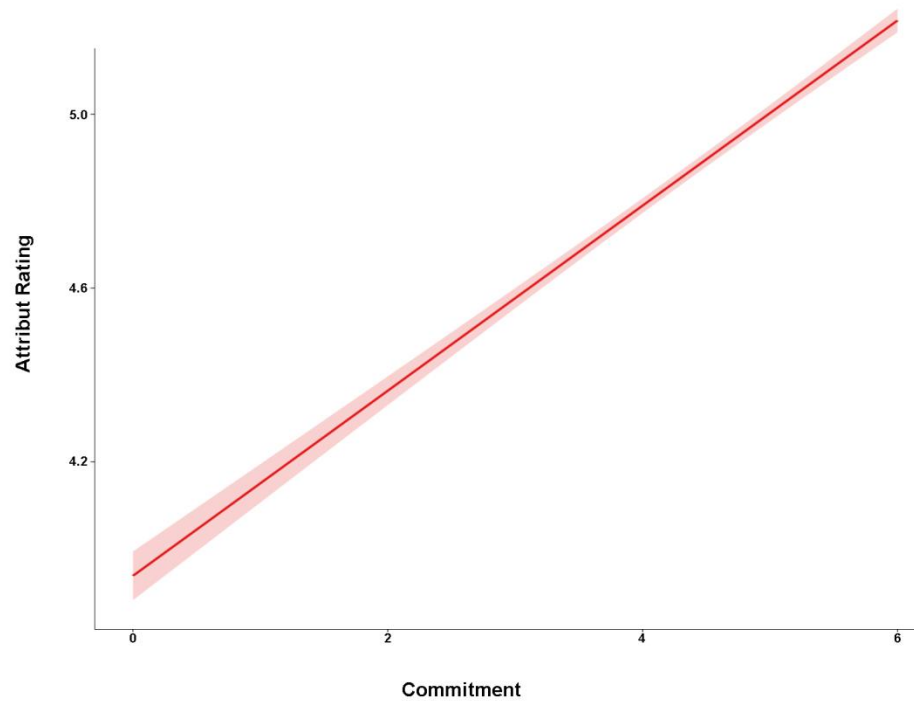


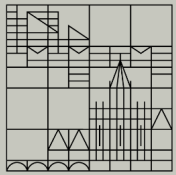
Identity Goal Activation



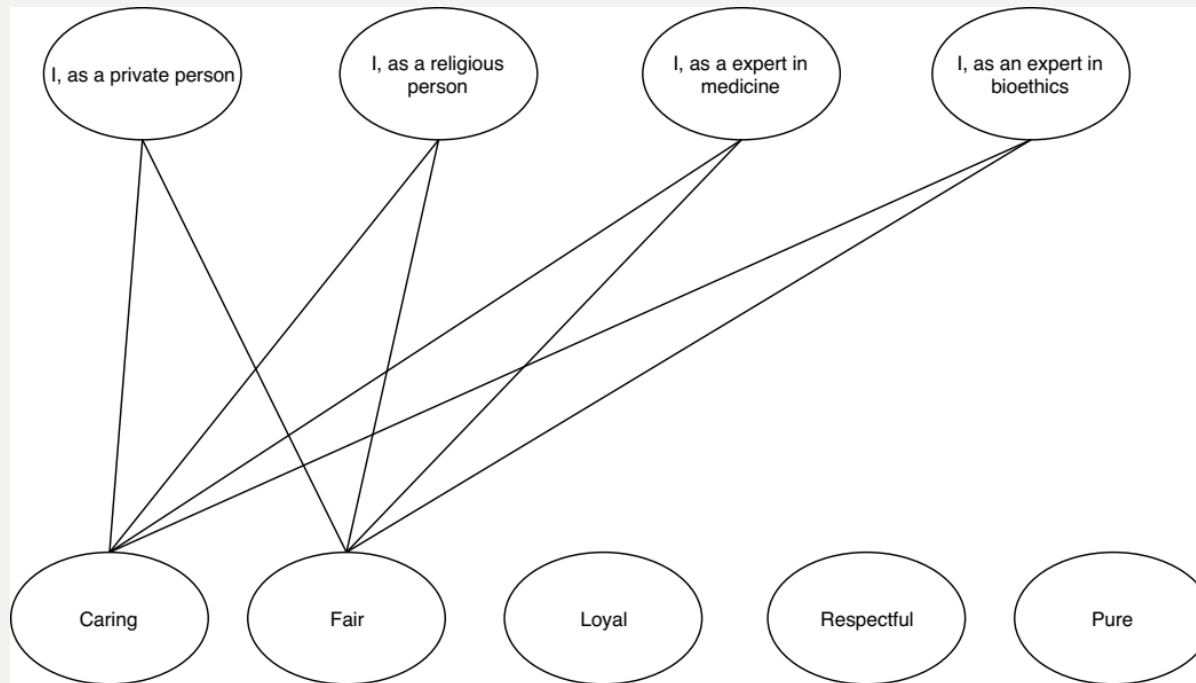


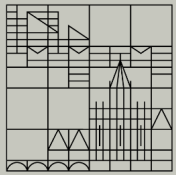
Identity Goal Commitment



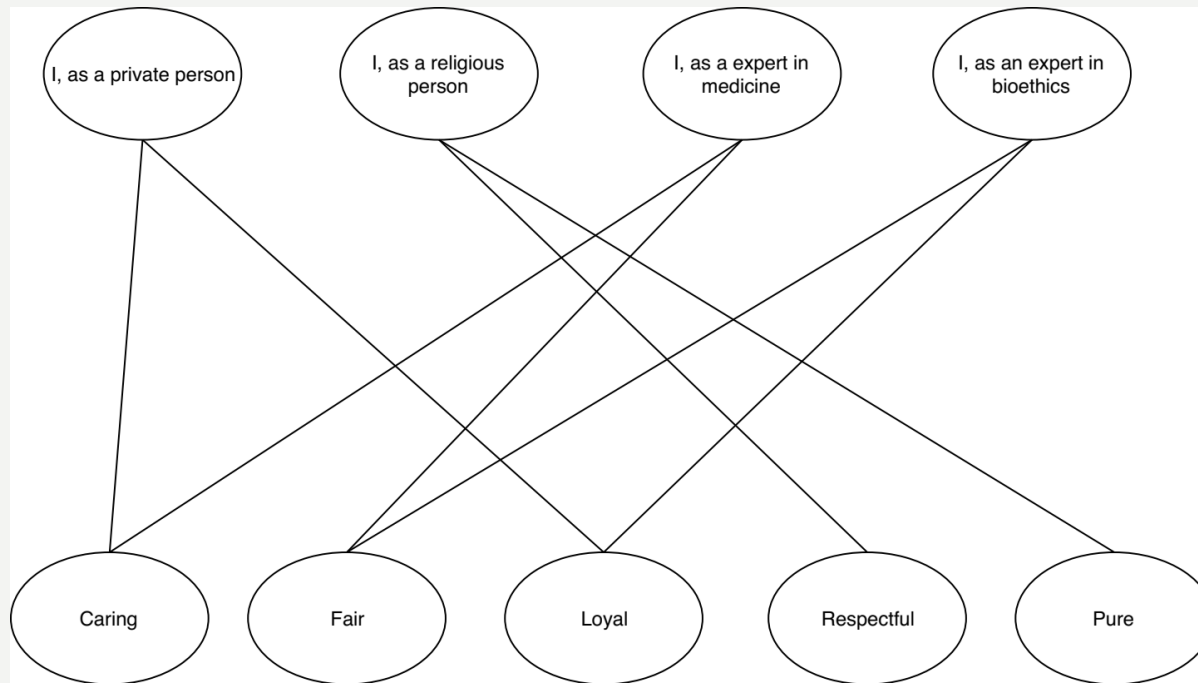


Self-Complexity



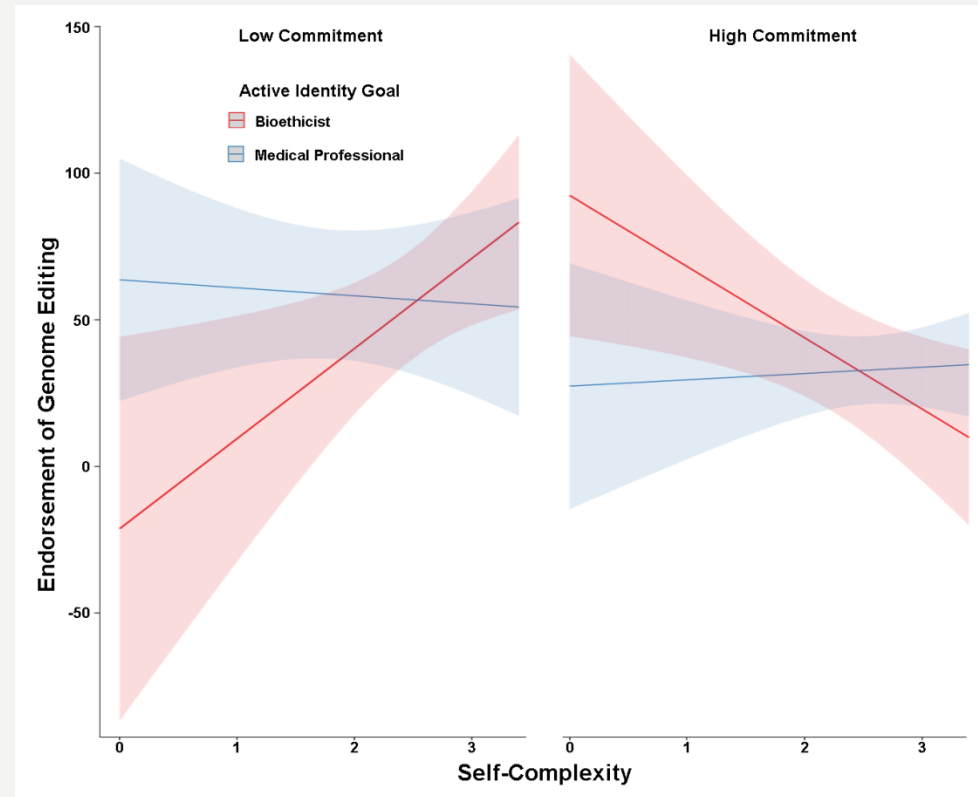
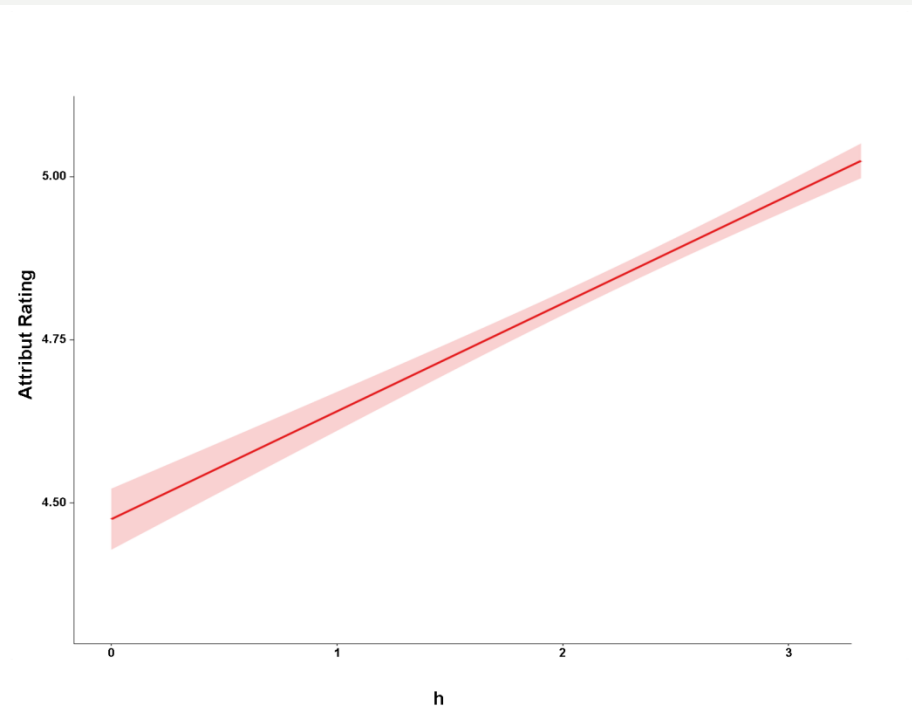


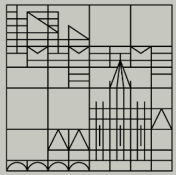
Self-Complexity





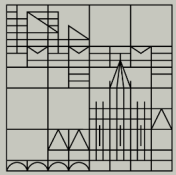
Self-Complexity





Discussion

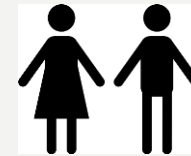
- Identity goal activation impacted bioethical judgments
- The relation of identity specific attributes (e.g., self-rated fairness) and bioethical judgments depends on commitment
- Self-complexity affects moral self ratings and moral judgments



General discussion

Bioethical judgements are highly determined by context:

a) Context of application

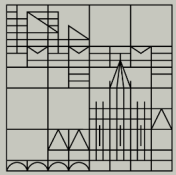


b) Individual features



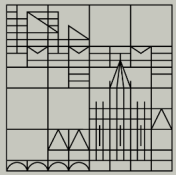
c) Identity goal activation





Future directions

- Replicate correlational findings
- Identify views specific for genetic technologies
- Role of social and learning context
- Refine measurement of self-complexity and bioethical views



Acknowledgements

LMU Munich

Nora Heinzemann, Luis Hillebrand,
Ophelia Deroy, Viet Tran

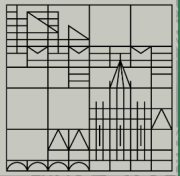


University of Konstanz

Peter Gollwitzer, Lea Oppermann

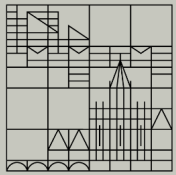


Federal Ministry
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Thank you for your attention!

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johannes.doerflinger@uni-konstanz.de



References

Gaskell, G., Bard, I., Allansdottir, A., Da Cunha, R. V., Eduard, P., Hampel, J., ... & Meijknecht, A. (2017). Public views on gene editing and its uses. *Nature biotechnology* 35(11), 1021.

Harman, G. 1999. "Moral Philosophy Meets Social Psychology: Virtue Ethics and the Fundamental Attribution Error." *Proceedings of the Aristotelian Society* 99: 315-331.

Images

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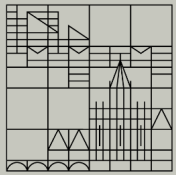
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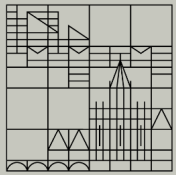
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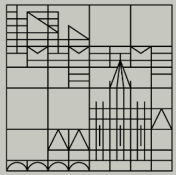
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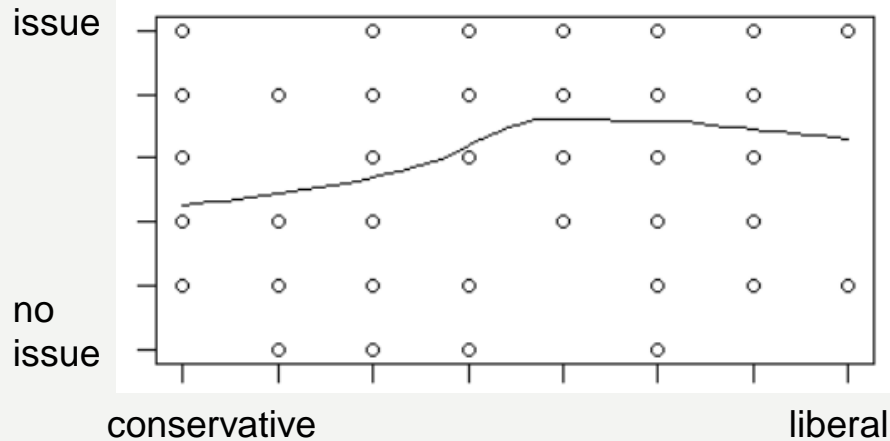
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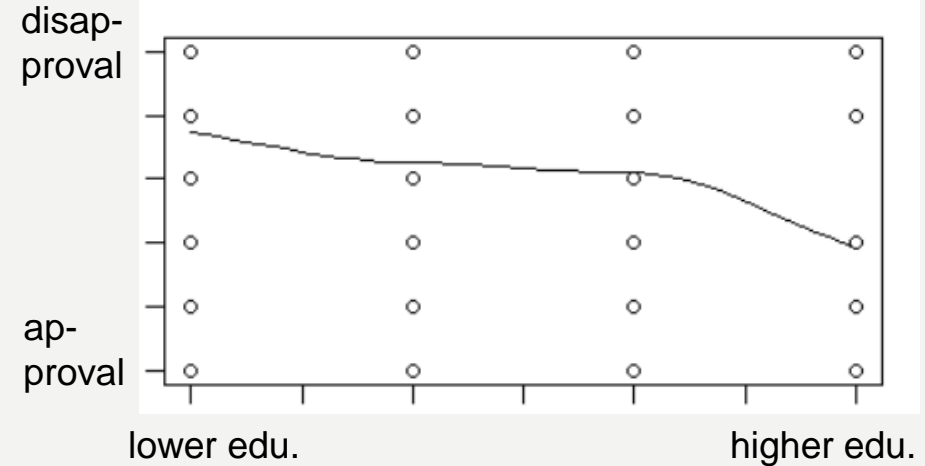


Politics ~ Social justice



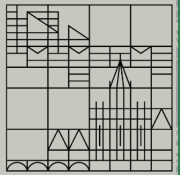
conservatives see less issues
for social justice

Education ~ Reproductive medicine



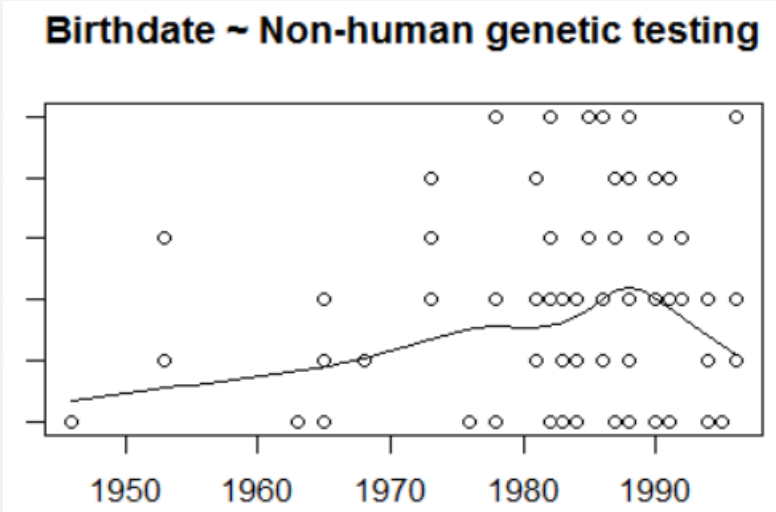
higher educated are less
opposed to genetic
testing/editing
in reproductive medicine

Both significant ($p < 0.05$), but small correlations
(r -squared = 0.08, 0.04 respectively)



disap-
proval

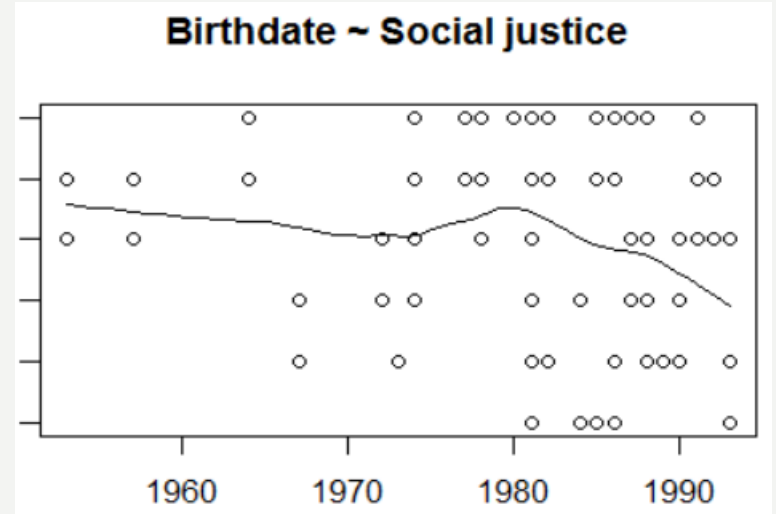
ap-
proval



Younger people more opposed to non-human genetic testing

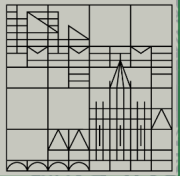
issue

no
issue

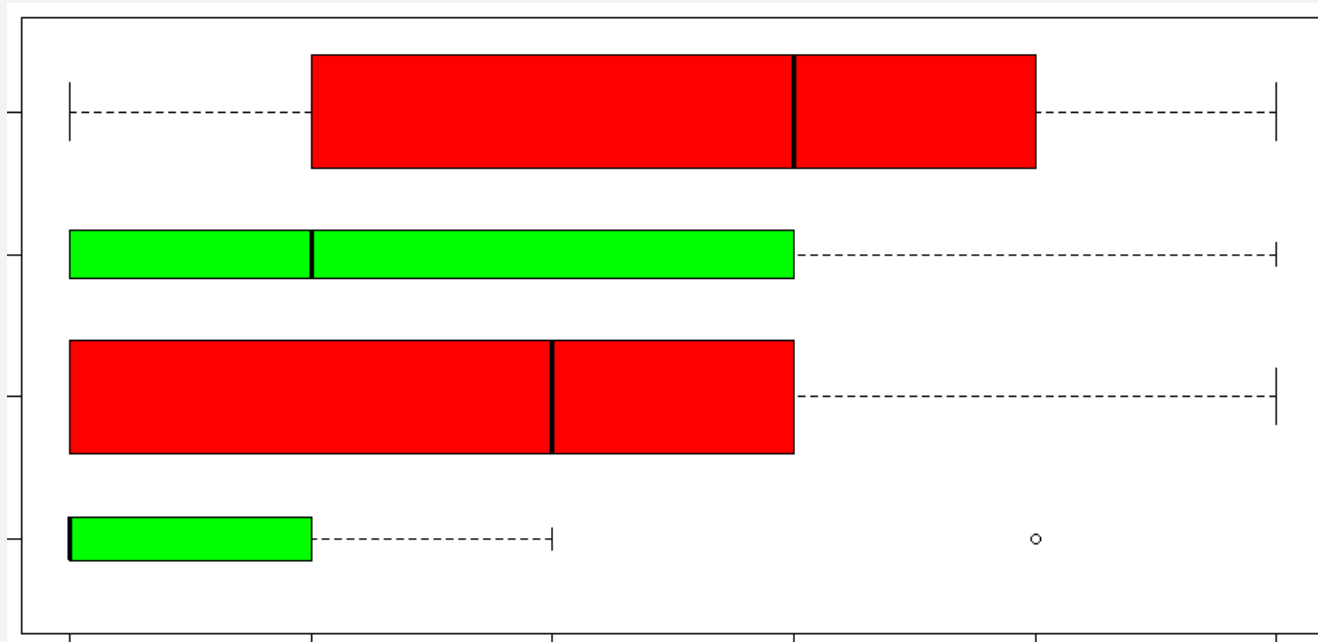


Younger people see less issues for social justice

Both significant ($p < 0.05$), but very small correlations (r -squared = 0.04 for both)



Experience with genetic testing



no exp.

experience

no exp.

experience

Strongly agree

Strongly disagree

t-tests significant ($p < 0.05$)

