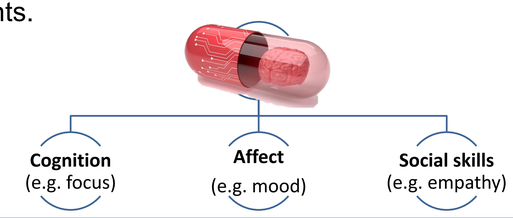
The US public perspective on what should influence neuroenhancement policies

Saskia Hendriks[1], Xiaobai Li[2], Christine Grady[1], Scott Kim[1]
[1]Dept. of Bioethics, CC, NIH [2]Biostatistics and Clinical Epidemiology, CC, NIH

Background

- Some individuals are using drugs or devices to try to enhance cognitive and social-affective functioning.
- Institutions (e.g., universities) are therefore making decisions on whether to allow neuroenhancement.
- Whether institutions should consider potential societal effects of neuroenhancement (e.g., worsening inequality), besides risks and benefits to users in these decisions is unclear.
- We examined how several potential individual and societal effects of neuroenhancements affect the public's support for institutions to allow or restrict neuroenhancements.



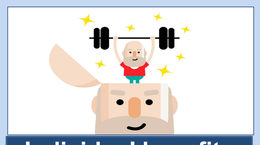
Methods

Survey tool
- Discrete choice experiment developed based on the literature
- 6 enhancement characteristics and a range of 2-4 realistic levels for each characteristic
- Scenarios created using a fractional factorial design
- Per scenario, respondents were asked which of two hypothetical prescription pills they most supported as being allowed based on the pills effects and the regulator
- Pilot tested through 21 cognitive interviews, 217 Amazon Mechanical Turk respondents

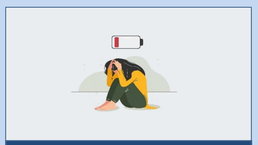
Participants and data collection
- Constructed representative sample of the US adult public in 2022 (required sample size: n=900)
- **Participants (n=927) resembled the adult U.S. population in several demographic characteristics**

Analysis
- Multinomial logit models

Characteristics and levels



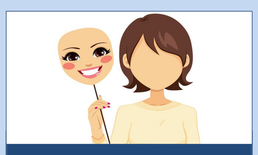
Individual benefits
No benefits, temporary benefits without long-term impacts, meaningful long-lasting benefits wellbeing



Individual risks
No risk, 1% risk of mild side effects, 1% risk of severe side effects

Societal well-being
Decreasing societal wellbeing, neutral, or improving societal wellbeing

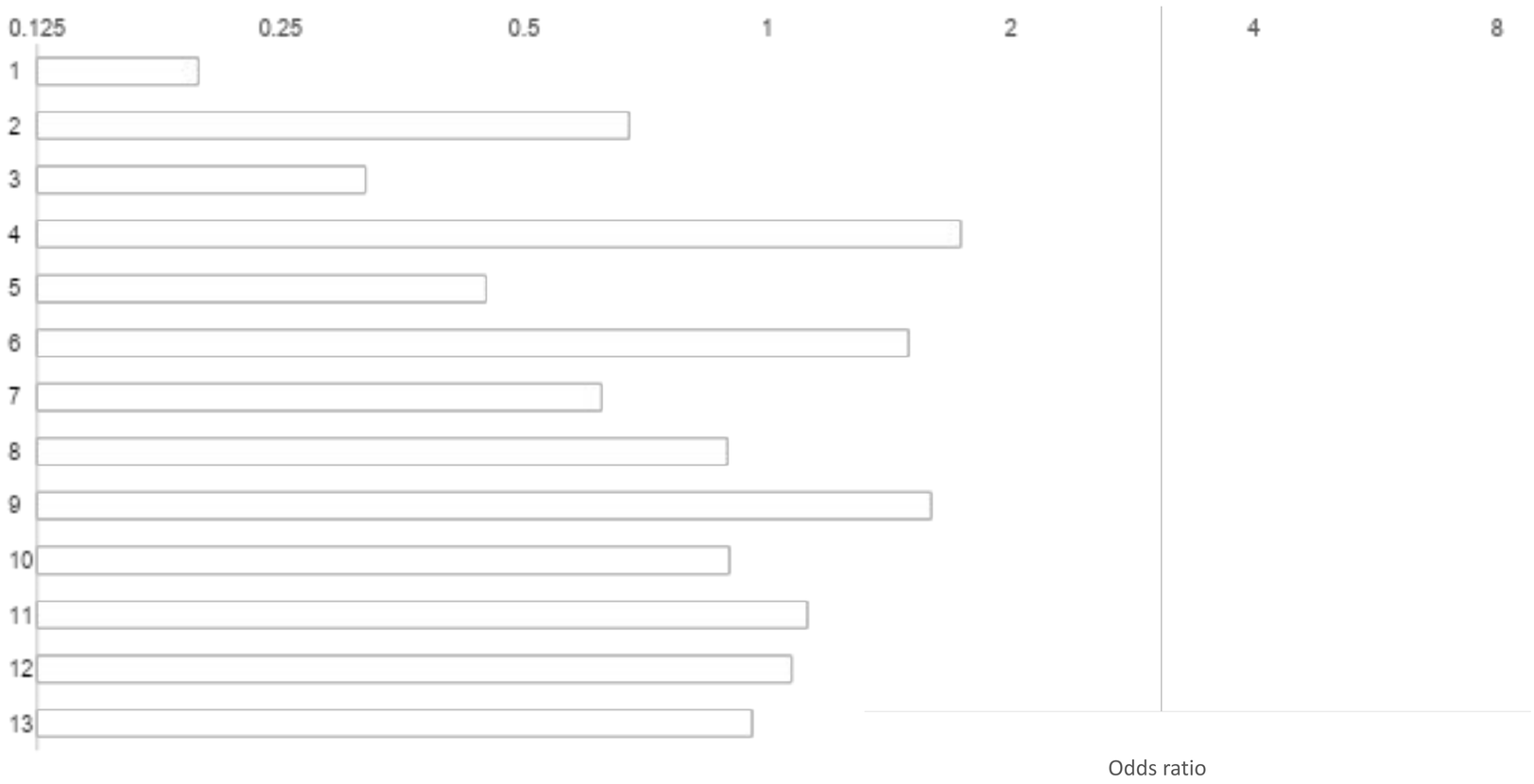
Justice
Improving equality, neutral, worsening inequalities, giving users an unfair competitive advantage



Authenticity
Whether users' authenticity is decreased

Institution
Government, doctors, universities or employers

Effect of enhancement characteristics and institution on whether participants think neuroenhancers should be allowed



Main results

Effect of neuroenhancers' characteristics on participants' support for allowing neuroenhancers:

- **Large negative effect**:
  - Risks of serious side effects (OR 0.20, CI:0.18-0.22)
  - A lack of benefits for users (OR 0.31, CI:0.26-0.38)
- **Moderate negative effects:**
  - A risk of mild side effects (OR 0.67, CI:0.62-0.74)
  - Negative effect on societal well-being (OR 0.45, CI:0.40-0.50)
  - Worsen inequality (OR 0.62, CI:0.55-0.71)
- **Moderate positive effects:**
  - Prospect of more meaningful, long-lasting benefits for users (OR 1.74, CI:1.61-1.87)
  - Improved societal wellbeing (OR 1.60, CI: 1.35-1.65)
  - Improved equality (OR 1.50, CI: 1.41-1.80)
- **Small negative effect:**
  - Reducing users' authenticity (OR 0.90, CI:0.84-0.97)
- **No effect:**
  - The institution regulating neuroenhancers
  - Users have an unfair advantage

Secondary findings

- Participants weighted risks to users (p<0.0001), societal wellbeing (p=0.03), and justice (p<0.0001) differently depending on which institution regulates neuroenhancers
  - E.g., if neuroenhancers worsened inequalities, this reduced participants' support for allowing them more for governments than for employers (OR=0.50 p=0.0002), doctors (OR=0.46 p=0.002), or universities (OR=0.51 p=0.01)
- Relationship between participants' demographics and the effect of societal wellbeing or justice on their choices:
  - Participants who have taken over-the-counter supplements for neuroenhancement were more likely to approve of neuroenhancement when it improves societal wellbeing (OR=1.32 p=0.02)
  - Liberals were less likely than conservatives to support allowing neuroenhancers which worsen inequality (OR= 0.74 p= 0.03)

Implications

When presented with both individual and societal considerations, **the public supports governments and other institutions making policy decisions about neuroenhancers based on risks and benefits for users, as well as, but to a lesser extent, effects on equality and societal well-being**

These findings should inform future policy discussions