

“A Life-Cycle Framework for Assessing Ethical and Social Issues for Emerging Technologies, and the Case of Neurotechnology-Enabled Brain Research”

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Four Abbreviations

- ESI = ethical and social issue
- ET = emerging technology
- NT = neurotechnology
- NEBR = neurotech-enabled brain research

A Life-cycle Approach to ESI of ETs

Developmental stages of an ET include:

- funding
- R&D
- testing
- release to market decision process
- diffusion
- use

Stage-specific ethics-related issues

- opportunity costs
- design features (**see slide #5**)
- consent
- evidence source
- risk evaluation (“rationalist”/“subjectivist” approaches)
- access mode
- concept of harm, and conventional cost-benefit analysis



Short-Handled Hoe: Banned in 1974(California)



(15 inches long)



With a short-handled hoe, workers could see the weeds and crop plants better.

Stage-specific ethics-related issues

- opportunity costs
- design features (show slide #5)
- consent
- evidence source
- risk evaluation (“rationalist”/“subjectivist” approaches)
- access mode
- concept of harm and conventional cost-benefit analysis (CBA)

Neurotech(NT)-enabled brain research (NEBR)

- Some NTs will likely enable BR that yields info w/ therapeutic value; others could be developed that enable BR that yields knowledge about brains that allow them to be **graded and ranked** based on their physical properties.
- risks of harm
- Would NT developers be ethically responsible for such outcomes?
- Are scientific researchers ethically responsible for harmful outcomes of some technological applications made of their 'neutral' research?
- **Leon Lederman: "We [scientists] give you the powerful engines, you [society] steer the ship."**
- w/ NEBR, the situation is **the REVERSE**: tech. appls. enable brain research.
- Key: is the prevailing matrix of political-economic and cultural forces cause for concern re what could be done w/ results of specific NEBR projects?
- Historical note: given the prevailing sociocultural matrix, despite the feigned ignorance of a few, key Topf and Sons engineers were (rightly) held ethically accountable for designing, building, and installing 66 'neutral' incineration ovens that facilitated the noxious activities of the organization (the SS) that contracted for them.

Key looming ethics-and-PubPol Issue :

will, as I suspect, the development of NEBR be hastened by enthusiastic, across-the-board public support under the assumption that proper 'fixes' will be found for any unexpected ethical or social problems that arise in practice,

OR,

should, as I hope, public support for NEBR be judicious, and contingent upon prior enactment of policy aimed at deterring harm-risking brain-information disclosure and use by researchers, doctors, and powerful social institutions?