

HARMONIZED PSYCHOLOGICAL PHENOTYPES IN HUMAN MOLECULAR GENETIC RESEARCH

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Goals of this presentation

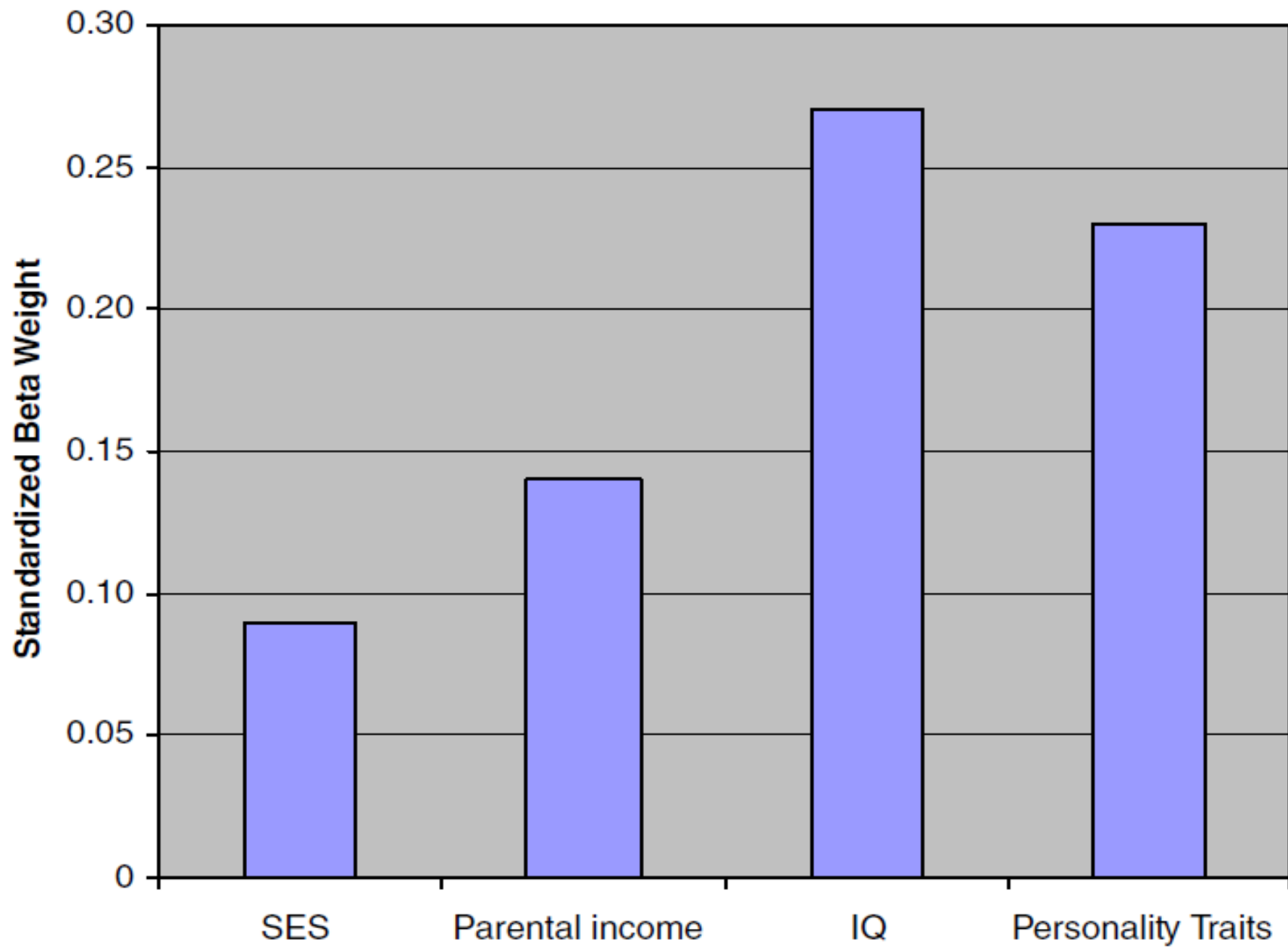


- 1. Encourage measuring personality routinely
 - ▣ Predictive validity in addition to utility for harmonious genetic research
- 2. Describe the PhenX project
 - ▣ Harmonized measurement of phenotypes and exposures
- 3. Briefly mention the relevance of psychometrics to creating harmony
 - ▣ If different measures were used, may be able to recover a harmonious measurement via modern models

Individual differences and social science



- Central role of individual differences in social science inquiry
- Personality and IQ are sturdy predictors of outcomes of interest in social science
 - ▣ Example : prospective occupational attainment effects in next slide (Roberts et al., 2007)



Encouragement to measure personality

- Personality is easy to measure and even brief measures are valid and reliable
 - ▣ Good consensus on five major domains (the “Big 5”)
 - Extraversion, Emotional Stability, Conscientiousness , Agreeableness, Openness
- Big Five Inventory
 - ▣ **44 items** to measure the “Big 5”
- Personality Inventory for DSM-5
 - ▣ Short form has **25 items** to measure *maladaptive variants* of the Big 5 domains
 - Detachment, Negative Affect, Disinhibition, Antagonism, Psychoticism
 - Advantage is connection with standard psychiatric nosology

Encouragement to measure personality

- Longer inventories provide more detail about “facets”
 - ▣ Elements of personality that are more narrow than the broad domains
 - ▣ Example : callous vs. manipulative
 - Both elements of antagonism but clearly not fungible
- A great way to increase validity is with *other report forms*
 - ▣ May be more feasible in family studies

First Five BFI items

| | | | | |
|----------------------------------|----------------------------------|---|-------------------------------|-------------------------------|
| 1 Disagree Strongly | 2 Disagree a little | 3 Neither agree nor disagree | 4 Agree a little | 5 Agree strongly |
|----------------------------------|----------------------------------|---|-------------------------------|-------------------------------|

I am someone who...

- _____ Is talkative
- _____ Tends to find fault with others
- _____ Does a thorough job
- _____ Is depressed, blue
- _____ Is original, comes up with new ideas

PhenX

- Consensus measures for phenotypes and exposures
 - (Krueger served as a member of the psychosocial working group)
- Goal was to create a compendium of measures for use in genetic epidemiology
- “Toolkit measures are well-established, high-quality, relatively low-burden measures and are intended for use in genome-wide association studies (GWAS) and other types of studies”
 - BFI is the personality measure included
 - Digit span from WAIS-IV is recommended for working memory (a facet of IQ)
- 21 major domains
- Top 5 Domains Downloaded
 - 1. [Demographics](#)
 - 2. [Alcohol, Tobacco and Other Substances](#)
 - 3. [Anthropometrics](#)
 - 4. [Cardiovascular](#)
 - 5. [Environmental Exposures](#)
- <https://www.phenxtoolkit.org/>

Psychometrics

- Psychometrics can be used to create harmony if different measures were used
- Test equating is possible using item response theory (IRT)
 - ▣ Reference different measures to the same underlying trait distribution
 - ▣ Example:
 - Two studies used different personality measures of the same construct
 - Item response functions (IRF) for the items on the *different* tests are referenced to the *same* underlying trait distribution
- Approach we are taking in next phases of personality GWAS consortium