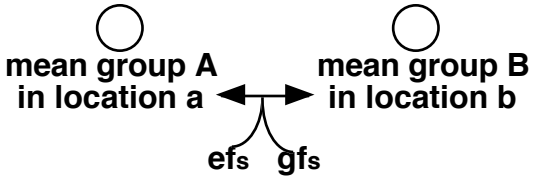
1. From typological thinking to recognizing possible heterogeneity



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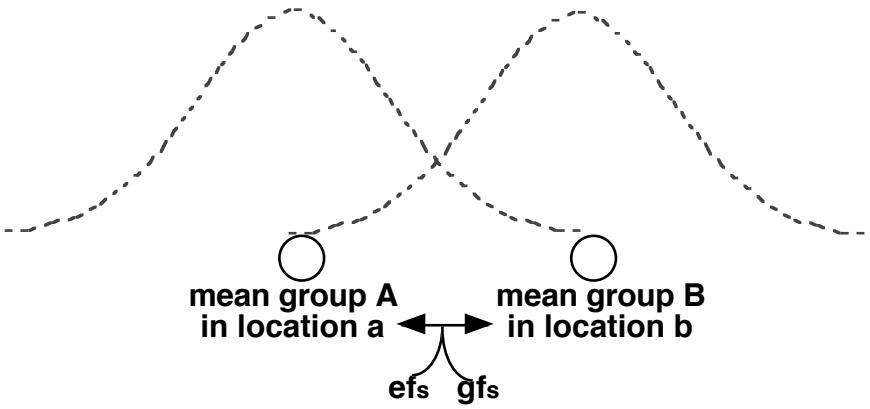

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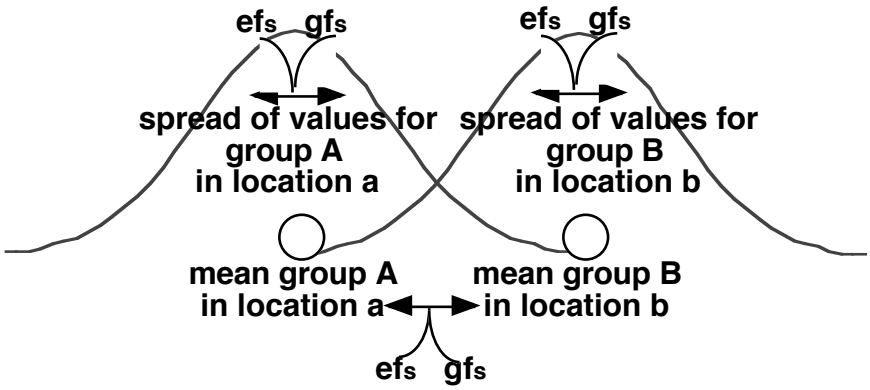

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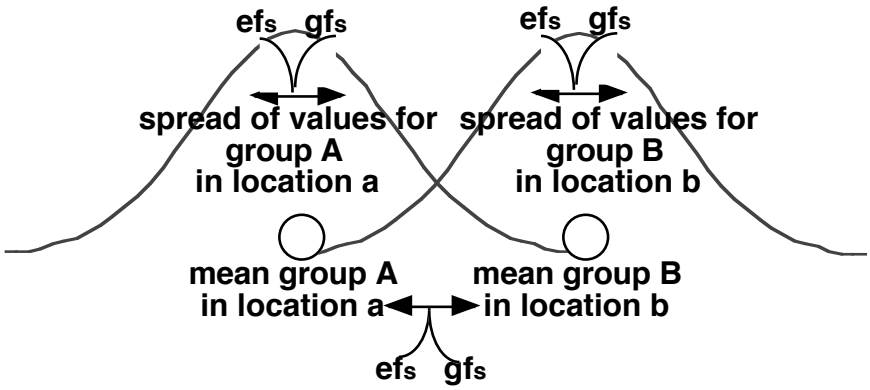

Q: Why treat observations this way?

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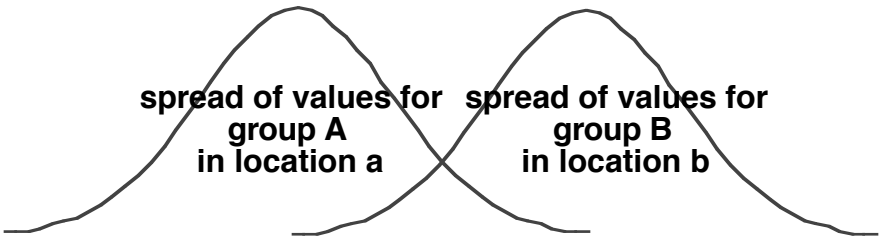

[PT: It's not the only way to treat observations]

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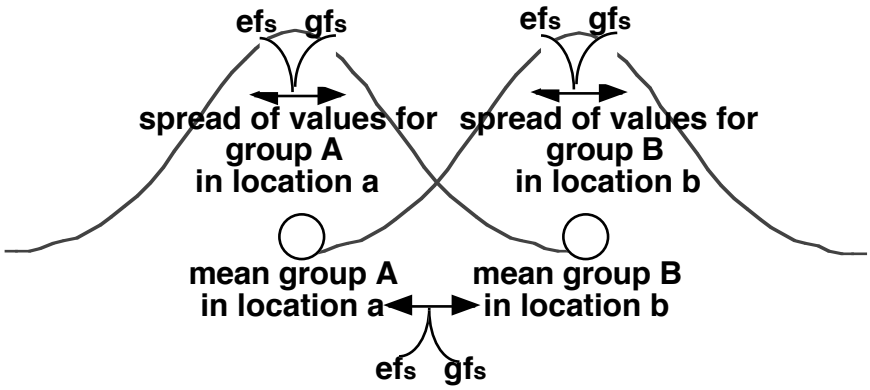

Q: Why treat observations this way?

[PT: a. Because world is seen as made up of separate differences between types + noise.
b. Because we don't care about the costs of misallocation when individuals are treated as if they were equal to the group average.
c. Because there truly are types.
BUT – We can't resolve whether this is true or the alternative picture if our methods assume it is true.]

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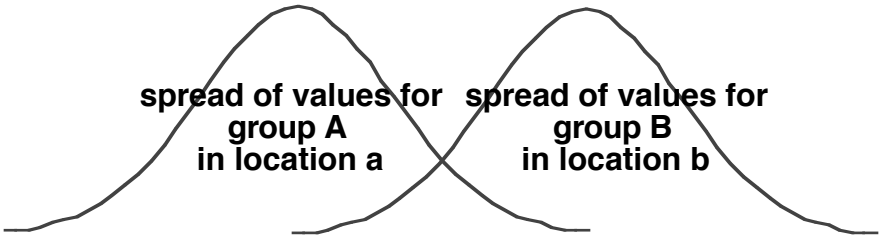

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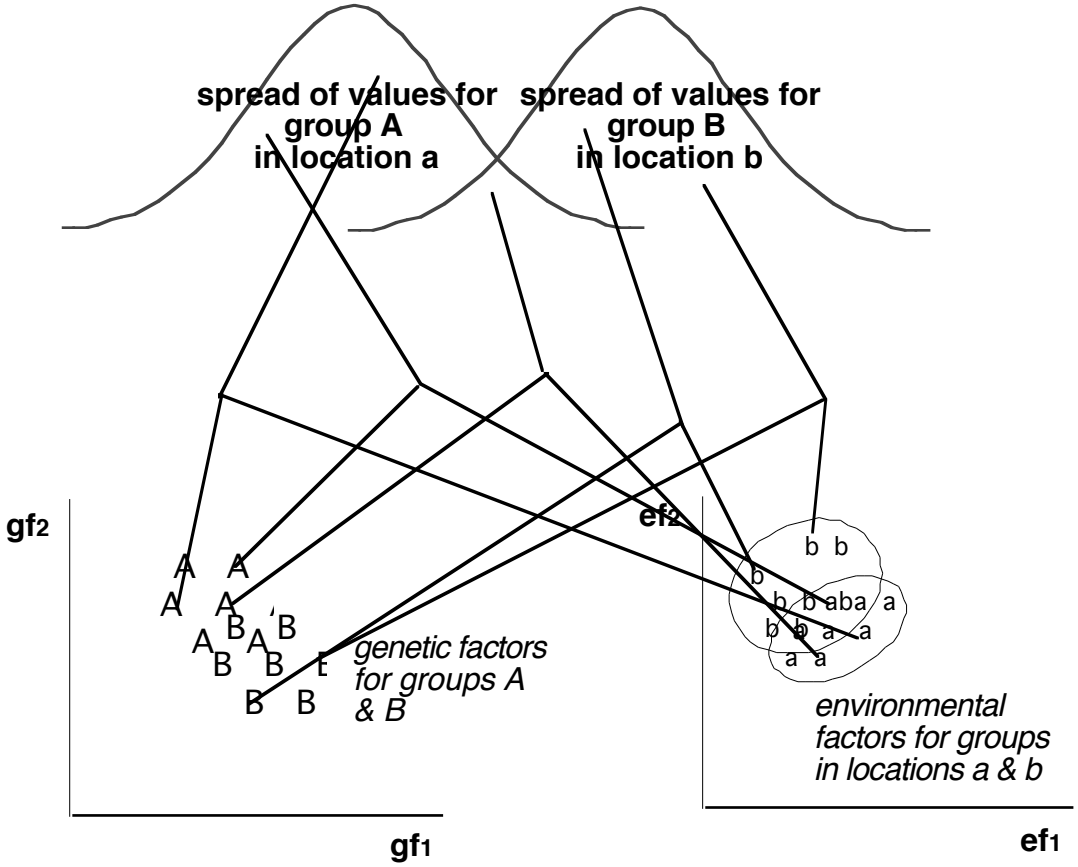

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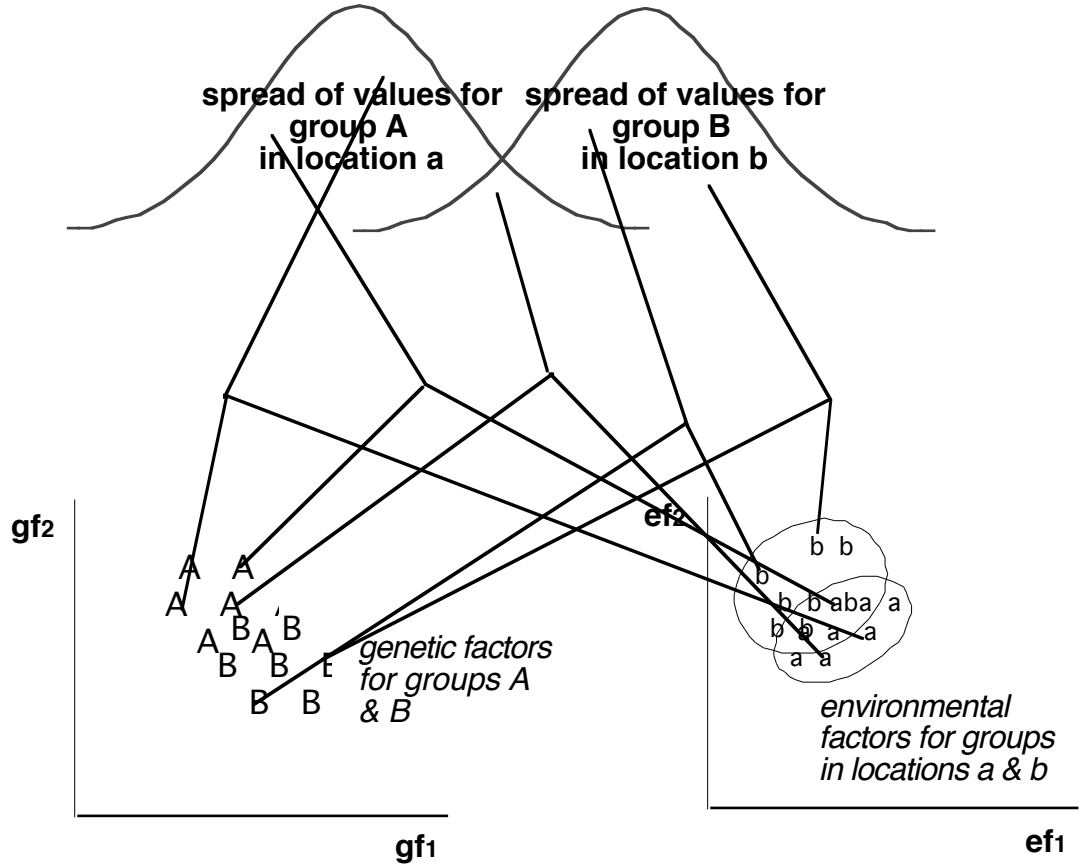
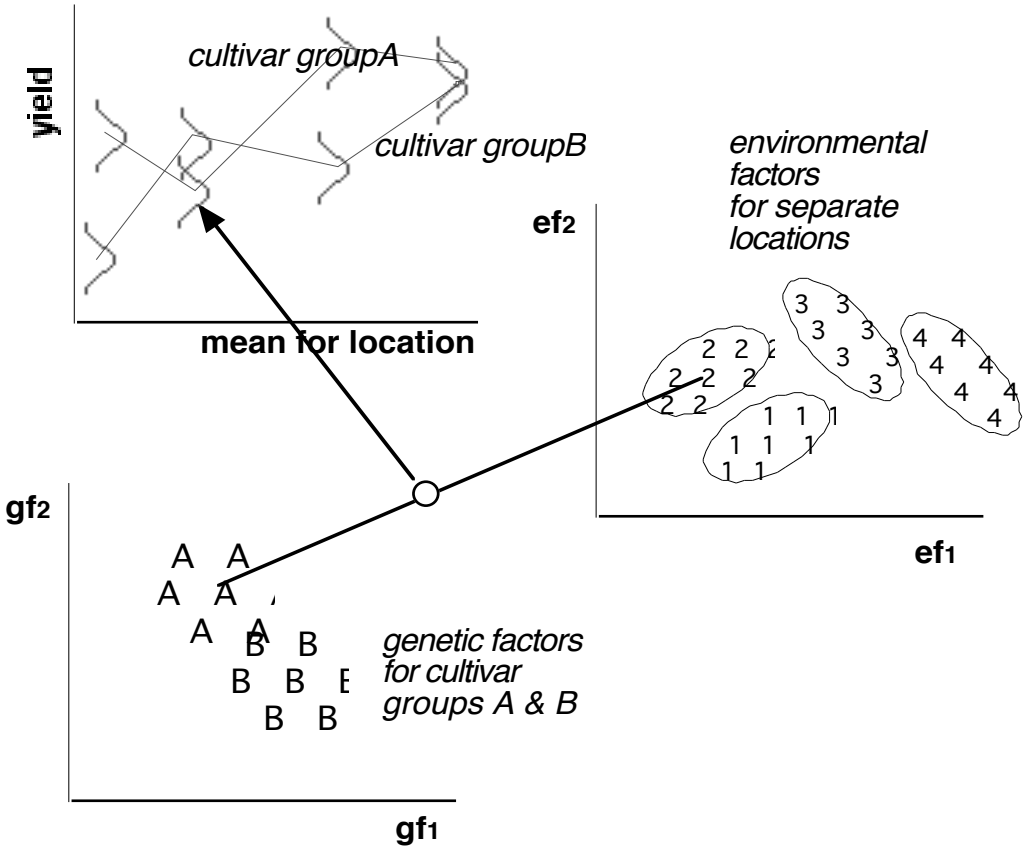


Q: How to expose these factors?

[PT: Possible if we have knowledge from other sources of development dynamics.
Even without this we can do something if we replace raw values with effects from Analysis of Variance, at least in agricultural cases.]

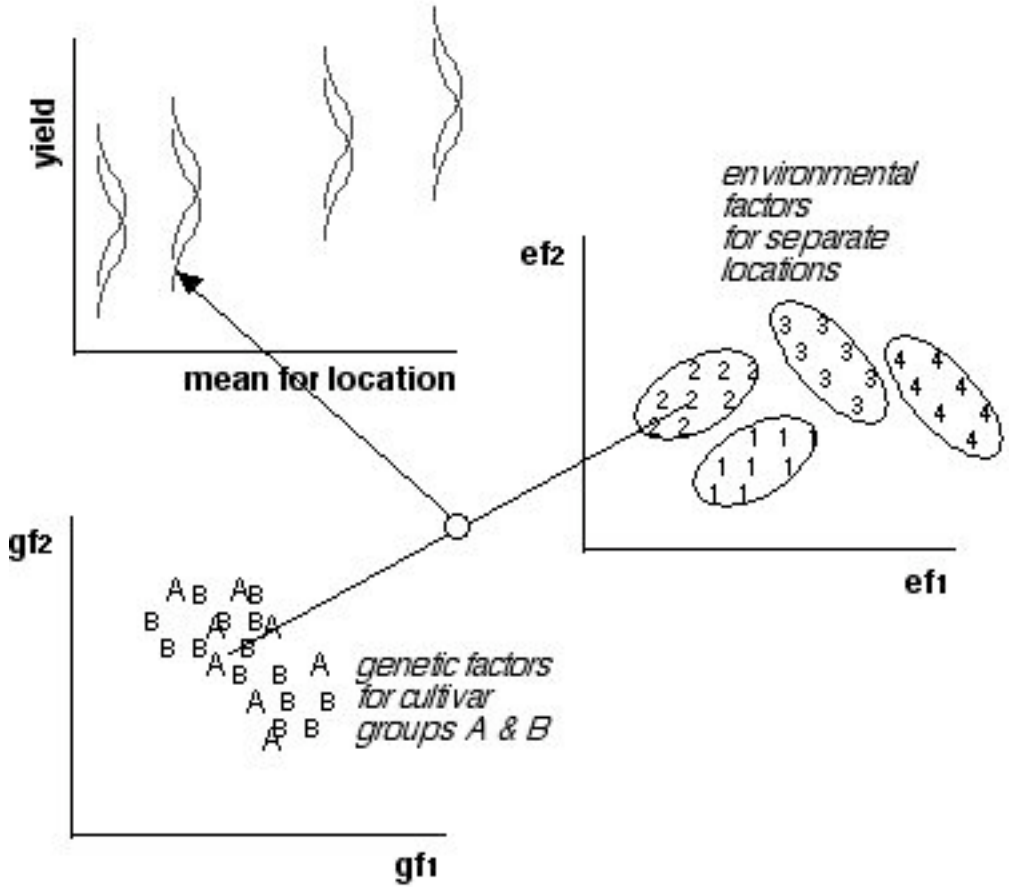
2. Analysis of crop trials vs. human data



Patterns in data in relation to homogeneous genetic and environmental factors

[PT: Cluster analysis if used to group cultivars by similarity of responses across locations. Spread of values within cultivar group at any location is reduced. More likely that underlying factors are the same within a cultivar group. Hypothesizing can be fruitful.]

2. Analysis of crop trials vs. human data



Patterns in data in relation to heterogeneous genetic factors

Cultivar groups A and B have not been formed by cluster analysis

[PT: Spread of values within cultivar group at any location is large. No confidence that underlying factors are the same within a cultivar group. Hypothesizing unlikely to be fruitful. This is the situation for human data.]

3. Connections from one kind of data analysis to the next

	Crop trials (varieties each replicated over a number of locations)	**Human studies of twins and other relatives**
Observations of a trait that differs across different varieties and locations	AOV + Cluster analysis + knowledge from sources outside data ->	
| v	hypotheses about measurable factors	
Observed associations with measurable factors	Significant factors from regression analysis ->	
| v	factors for testing through experimental trials	
Experiments that vary measurable factors	Significant factors->	
| v	insights for investigation of dynamics of development	
Factors over sequence of development [rarely-realized ideal]	Significant factors in development in controlled research conditions ->	
| v	candidates for interventions in less controlled situations	

4. Connections from one kind of data analysis to the next

	Crop trials (varieties each replicated over a number of locations)	Human studies of twins and other relatives
Observations of a trait that differs across different varieties and locations	AOV + Cluster analysis + knowledge from sources outside data ->	AOV (& path analysis) not helpful in generating hypotheses about measurable factors
| v	hypotheses about measurable factors	(hypotheses about factors drawn from other sources)
Observed associations with measurable factors	Significant factors from regression analysis ->	Significant factors from regression analysis ->
| v	factors for testing through experimental trials	Same as on the left (but more questionable if factors can be manipulated w/out modifying structure of dynamics)
Experiments that vary measurable factors	Significant factors->	(Rare)
| v	insights for investigation of dynamics of development	?
Factors over sequence of development [rarely-realized ideal]	Significant factors in development in controlled research conditions ->	?
| v	candidates for interventions in less controlled situations	?

4. Possible Angles of STS Investigation

Conceptual reconstruction and extensions

* Debate conceptual oversights or missteps
    incl. relevance of ag. methods to analysis of human variation
* Realizable intervention built into inferences about causality
    Circumscribed re-run sense of causality
    incl. Wider relevance in social science and epidemiology
* Policy interventions alter the structure of the relations that produced the observations
* Inattention to heterogeneity and typological worldview
* Nothing essential of each group that leads to differences in averages
* Philosophical discussion obscured the relevance of heterogeneity

4. Possible Angles of STS Investigation

History of translation from ag & lab breeding to human genetic analysis

* How restrictive conditions discounted or forgotten around heritability estimation
* Trace Wright's notation from its origin through its adoption in human genetics

4. Possible Angles of STS Investigation

Racialized imaginaries in the analysis of differences among groups

* Persistent interest in explaining differences among averages for groups defined on racial grounds
* What can be done unless individuals are treated on the basis of their group membership
* Heterogeneity not acknowledged = typological or essentialist assumptions?
* Racially essentialist imagination facilitated transfer of conventional statistical tools from ag to human research?
* Transfer of tools from selective breeding = hopes and fears?

4. Possible Angles of STS Investigation

Engagement of STS scholars with scientists

* STS scholars: reflexive about what they aim to do with our own knowledge claims
  incl. interpretations pointing to shortcomings in the science
* Influence working scientists or education of future scientists?
* When to "go native"? When to become active citizens or consultants in policy debates?
* PT: indirect influence = interest STS scholars in delving deeper into some of the above areas of STS
* PT: more direct engagement with scientists = use my interests and skills to draw attention to 4 areas of inquiry not obscuring the possible heterogeneity of factors