Variation into Elevation
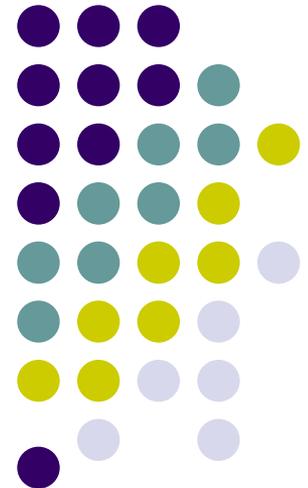
Diversity Paradigms for Understanding Team and Organizational Outcomes

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Co-Conspirators

- ## Introduction & Inspiration
  - Personal background
  - Joe McGrath

- ## Colleagues
  - Ken Price, Myrtle Bell
  - Katherine Klein
  - Stephen Humphrey, Caroline Bartel, Ravi Gajendran, Susan Mohammed, Hong Ren, Taeya Howell

- ## Current Students
  - Seung-Hwan Jeong (gender diversity & perf in TMTs)
 - Natalie Longmire (perspective-taking in teams)

Guideposts

- Sociological (Surface) and Psychological (Deep) Diversity Paradigms

- Team Composition: Differences to Diversity Types
  - **_Variety_**: meaning & operationalization
  - **_Separation_**: meaning & operationalization
  - **_Disparity_**: meaning & operationalization

- Challenges relating variation (σ) to elevation (μ)
  - thorny problems of demographics
  - using diversity types to predict outcomes
    - control for mean; low R^2
  - measurement & sampling issues for diversity types

Diversity Paradigm

- *Diversity* borrowed from environmental biology; became established label for particular (EEO) demographic characteristics

- Other related terms: heterogeneity, relational demography, dissimilarity, distance, inequality

- "Dispersion" or *spread* may be most intuitive

- Conventional versus Diversity Proposition:

Diversity (variation) of X predicts → **Mean (elevation) of Y**
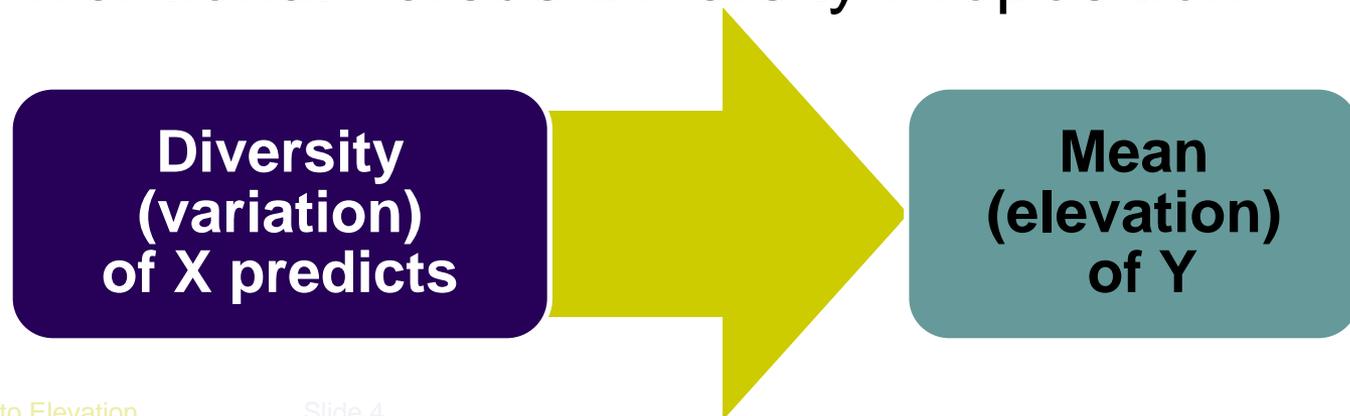
Diversity Explosion

- Workforce projections; globalization
  - changes in employee populations
  - changes in political, public speech

- Ease of study
  - got groups? got demographics?
  - got diversity

- Wave of academic popularity
  - nearly exponential growth in published works; doubling every eight years (projected > 750 in 2016)
  - spans disciplines, traditional levels

- Broader sampling of viewpoints

Examples

- Used widely in management & related disciplines
  - I/O & market economics
  - VSR, pop ecology view of firm survival, advantage
  - Consortia & cartels
  - TMT heterogeneity
  - Founding, steering, & resources in e-ship
  - Team composition, process, performance
  - Dyadic interaction
  - Individual experience of social / collective environment
- A different way of *thinking* and *researching*
- Inherently levels-based (think nested, HLM, RCV)

Diversity Villains & Heroes

- Profusion of seemingly contradictory theory
  - social categorization; similarity-attraction; ASA; social loafing; resource heterogeneity; requisite variety
  - at least <u>two narratives</u>
- Diversity as insidious villain:
  - leads to miscommunication, conflict, disintegration, withdrawal
  - leads to perceived injustice, suppressed voice, competitiveness
- Diversity as conquering hero:
  - leads to leads to creativity and comprehensive problem-solving

Are Villains Stronger than Heroes for Diversity?

- To resolve who wins the diversity story while building teams, need to re-think member differences

- What is diversity really *about?*; What are fundamental dimensions; What differences *mean the most?*

  - Surface-level versus deep-level differences

    relative to / crossed with (?)

  - Villains versus heroes for effectiveness

What Diversity Is *Not*

- ● Different terms, treatments across sub-domains
  - ● Demographic dissimilarity, distance, difference, disagreement,, dispersion, _____ (insert favorite d-word here), heterogeneity
  - ● KSA diff's, VBA diff's, personality diff's, background diff's

- ● Inconsistent findings, uncertain conclusions

- ● What is our collective enterprise really ***about?***

- ● Stipulated: not about / diversity isn't:
  - ● a property of individuals (perhaps "breadth" is)
  - ● a property of teams per se – instead, a <u>property of the composition of an individual attribute</u> within teams
  - ● only surface-level differences (multiple, confounded)
  - ● one thing

What Diversity *Is*

- Sense-making of domain via formal typology (Harrison & Klein, 2007, *AMR*)

- Stipulated: is about <u>configural property</u> of teams:

  - the ***distribution of differences*** among members within a unit with respect to ***a particular feature, X,*** such as functional background, tenure, ethnicity, satisfaction, work ethic, pay, individualism, etc.

  - a dynamic or 'standing' (fixed) feature X

  - a typology of three things:

<u>*V*</u>*ariety*, <u>*S*</u>*eparation*, or <u>*D*</u>*isparity*

Picking a Diversity Hero or Villain

- Specifying and justifying the choice of three diversity types creates:
  - Clarity and precision of language and ideas
    - Variety reflects information (usually hero)
    - Separation reflects standpoint (usually villain)
    - Disparity reflects possession (another diabolical cackler)
  - Paves the way for:
    - More falsifiable theory
    - Constructive intellectual debate
    - Alignment of theory and method
- Apply to a favorite diversity attribute

Defining **Variety**

- ***Differences on attribute <u>V</u>, representing kind, category of unique (access to) ~<u>information</u>***
  - <u>configuration of knowledge</u>; likely V constructs are distinctive, non-overlapping ...
    - **knowledge**, skills, abilities (KSA's)
    - task familiarity, functional background
- Foundational theories: law of requisite variety, resource heterogeneity, information theory, groups as info processors
- Frequently predicted outcomes:
  - more creativity & innovation; greater unit flexibility
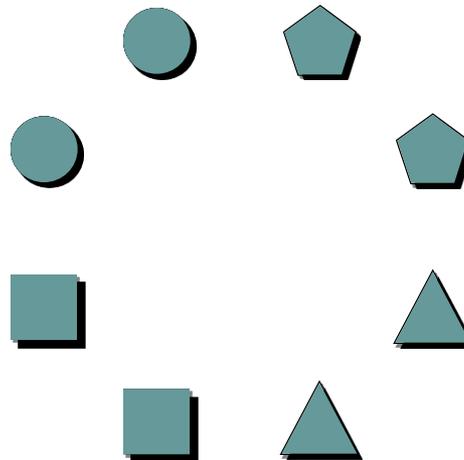 - higher decision quality

Illustrating **Variety**
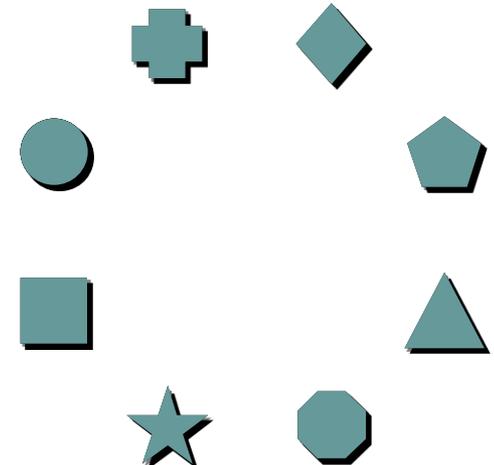
Minimum	Moderate	Maximum
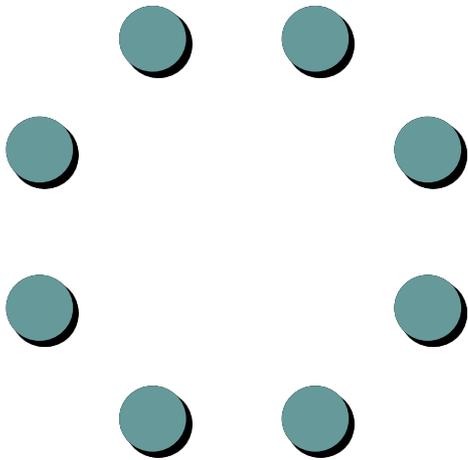
every member is or comes from same kind as everyone else

every member is or comes from different kind from everyone else

Team Example V

- Researchers studying hospital patient satisfaction
- Team V (max variety):
  - Members differ in formative discipline
    - 1 from psychology,
    - 1 from sociology,
    - 1 from anthropology,
    - 1 from management,
    - 1 from marketing,
    - 1 from nursing,
    - 1 from hospital administration, and
    - 1 from medicine (GP)

Operationalizing **Variety**

- Variety idea: difference is *uniqueness*;

- Distance is irrelevant beyond being distinct

- If no one unique on V, index should be zero

- Should be maximum when everyone is unique on attribute

- For meaningful index, feature V defined on individuals must be *nominal scale*

Formulae for **Variety**

- ## Blau's Index

  - $1 - \Sigma[p_k^2]$; p is proportion in each category
  - maxed at (K-1)/K, which can be close to 1

- ## Shannon/Teachman/Entropy

  - $-\Sigma [p_k \times \ln(p_k)]$
  - maxed at $-1 \times \ln(1/K)$, which can be very large

- ## Both

  - Minimum: 0
  - Maximum: all in different categories
  - Both increase with (counfounded by?) group size, # of categories, or potential sources of info (species!): K

Defining **Separation**

- ***Differences on attribute <u>S</u>, representing "standpoint," position on (lateral) continuum***
  - <u>configuration of feeling</u> (toward a target); likely S constructs are views, disagreement, opposition on ...
    - preferences, opinions, evaluations
    - attitudes, values
- Foundational theories: similarity-attraction, ASA, social categorization, social identity
- Frequently predicted outcomes:
  - less cohesiveness, lower trust,
  - more conflict, more social disintegration

Illustrating **Separation**

Minimum
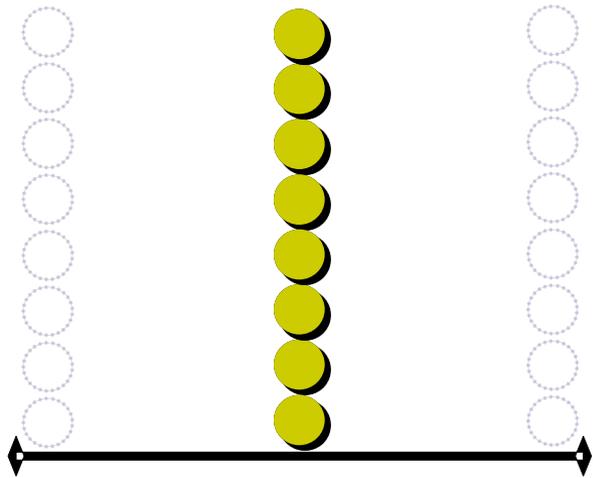
every member has
same position on
continuum

Moderate

Maximum

two polarized factions at
ends of continuum;
extreme bimodal

Team Example **S**

- Researchers studying hospital patient satisfaction

- Team **S** (max separation):
  - Members differ in views on qualitative / interpretive methods
    - half of the members revere interpretive methods and think they are necessary for understanding patient experience of hospital care
    - other half revile interpretive methods and believe they are worthless

Operationalizing **Separation**

- Separation idea: difference is *distance*;

- Direction not critical, just space between members: how *far apart* are positions of unit / team members?

- If there are no differences, distances on S are zero

- Maximum when aggregate of all distances is largest

- For distance to be meaningful, S must be *interval scale*

Formulae for **Separation**

- **Standard Deviation**
  - $\sqrt{[\Sigma(X_i - X\text{-bar})^2/n]}$; X_i is position for i-th team member
  - max is [(upper limit – lower limit)/2]; midpoint

- **Average Euclidean Distance**
  - $\sqrt{[\Sigma(X_i - X_{j \neq i})^2/n]}$ /n
  - max is [(upper limit – lower limit)/ $\sqrt{2}$]

- **Both**
  - minimum = 0; maximum = polarized extremes
  - do not increase with group size
  - same metric as underlying variable; S's not comparable across diversity features
  - divide by n (not n-1 b/c not estimating pop parameter)

Defining **Disparity**

- ***Differences on attribute <u>D</u>, representing share, proportion of socially valued assets, resources***
  - <u>configuration of dominance</u>; likely D constructs are concentration of ...
    - pay, compensation
    - prestige, status, power, authority, inequality
- Disparity is ***asymmetric***; direction matters
- Foundational theories: distributive injustice, (relative dep), social stratification, status char's
- Frequently predicted outcomes:
  - higher within-unit competition
  - reduced voice, less input (from "lower" members)
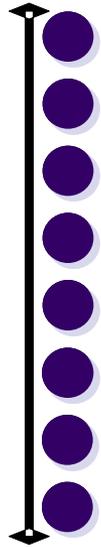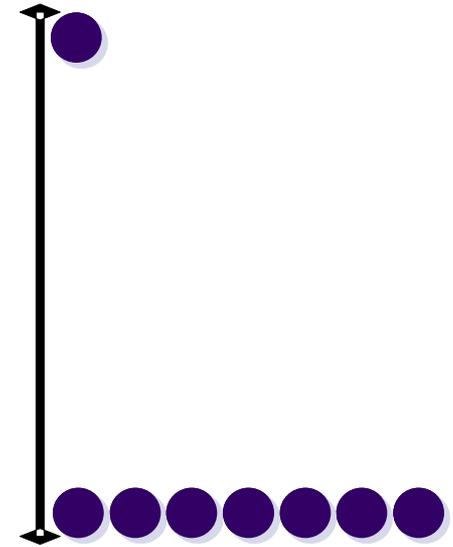
Illustrating **Disparity**

Minimum	Moderate	Maximum
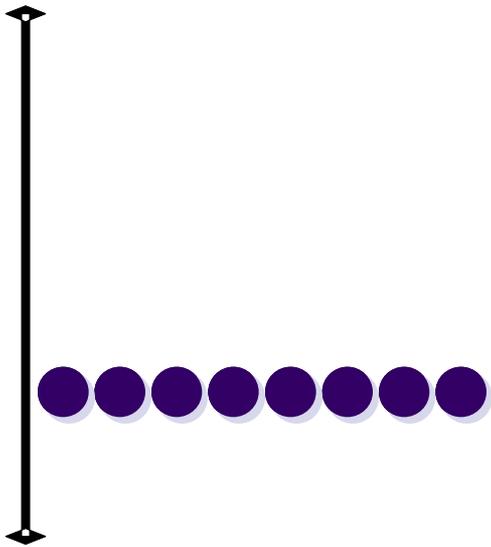
every member has an equal portion

one member is "rich," all the rest are (completely) impoverished

Team Example **D**

- Researchers studying hospital patient satisfaction

- Team **D** (max disparity):
  - members differ greatly in status, (power to allocate) resources
    - one member is a highly esteemed and published professor
    - others members are new doctoral students

Operationalizing **Disparity**

- Disparity idea: difference is *relative ownership*;

- Direction and size on D are crucial

- If all members have equal share of D, index should be zero;

- Maximum should occur when there is 1 king, n-1 pawns

- Make sure disparity is asymmetric (ownership means more; vertical differences matter)

- For meaningful index, D must be *ratio scale*

Formulae for **Disparity**

- **Coefficient of Variation**
  - $\sqrt{[\Sigma(X_i - \text{X-bar})^2/n]}$ / X-bar; max is $\sqrt{(n-1)}$
- **Gini (Herfindahl) Index**
  - $(\Sigma|X_i - X_j|)$ / $(2 \times n^2 \times \text{X-bar})$; max is $(1 - 1/n)$
- **Coefficient of Variation** & **Gini (Herfindahl)**
  - minimum: 0
  - maximum: single "owner" on top, rest "penniless"
  - both increase with group size, Gini less so
  - Gini (Herfindahl) is concentration ratio
  - both are appropriately *asymmetric*

Common Indexing Problem

- Beware the folly of conceptualizing **S**, while operationalizing **D**

- Coefficient of variation most often-used diversity index: SD/mean

  - **S** is at least interval; **D** must be ratio

  - For same level of within-unit separation, two scholars can get quite different estimates of diversity:

    - Team 1 ages: 18, 20, 22, 24, 26, 28, 30, 32

    - Team 2 ages: 43, 45, 47, 49, 51, 53, 55, 57

  - Team 1 has twice the "age diversity" of Team 2, despite both having same SD (as CV is poor index for *separation*, but fine for *disparity* if age = power)

Some Insights for Diversity Theory-Building

- **All minima are the same; consider the maxima**
  - max separation ≠ max variety ≠ max disparity

- **Definitions, shapes connote different processes**
  - max **_Variety_**: each is different
    - Tower of Babel, or
    - Openness to ideas and crossing boundaries
  - max **_Separation_**: polarized factions
    - Tight bonds within subunits, opposition between subunits
    - Deep-seeded disagreements, stalemates
  - max **_Disparity_**: One reigns over the others
    - Solidarity among the "lower echelons"
    - Resentment of the elite

Back to Diversity Paradigm

- Conventional proposition

  - versus

- Diversity proposition:

Diversity (variation) of X predicts → **Mean (elevation) of Y**
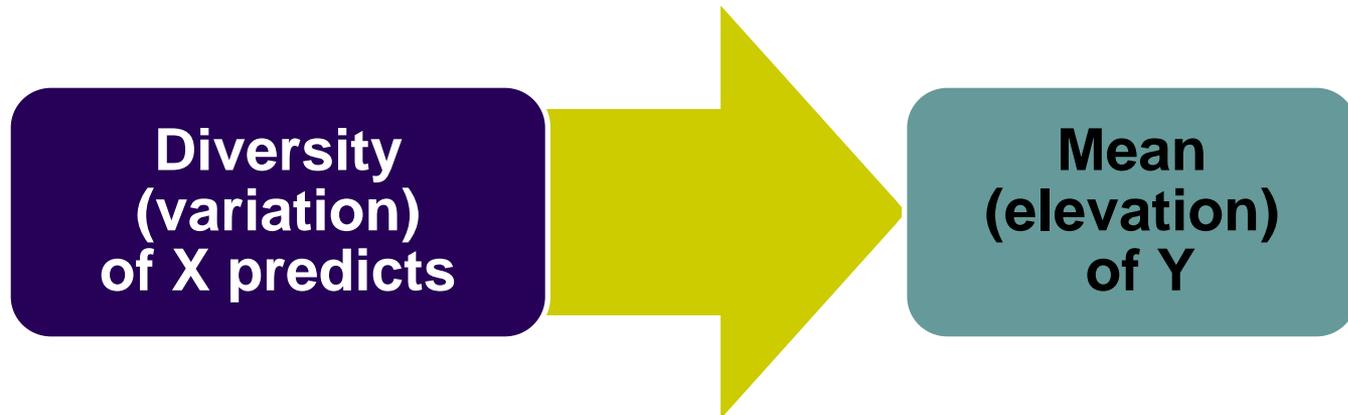
Where to put Demographic Diversity?

- Diversity of educational major or functional background: *variety*

- But, diversity of age, sex, ethnicity, tenure, educational level?

  - **<u>S</u>eparation**:	differences in attitudes
  - **<u>V</u>ariety**:	differences in knowledge
  - **<u>D</u>isparity**:	differences in status

- A priori statement is necessary, for theory and operationalization ...

Calling and Culling out Demographic Diversity

- If studying demographic diversity, need to make a type-based prediction

- Test assumptions underlying the type-based idea: is it really separation, variety, or disparity?

- Likely procedure:
  - drop down to individual level of analysis to assess the relationship between demographic characteristics and expected correlates within each of the units/groups
    - attitudes
    - knowledge
    - status

Common Analysis Problem

- For diversity types, *elevation* often confounded with *variation*, possible due to shape (floor, ceiling) effects

  - conclude within-unit diversity effect, but really unit-level main effect

  - conclude *no* within-unit diversity effect, but masked by unit-level main effect

- ***Always control for mean effects*** when studying any of three diversity forms (low incremental R^2)

  - $Y = \beta_0 + \beta_1(\text{mean of X}) + \beta_2(\text{dispersion of X})$

- Special case for disparity and use of CV:

  - $Y = \beta_0 + \beta_1[SD(X)] + \beta_2[1/(X\text{-bar})] + \beta_3[SD(X) \times 1/(X\text{-bar})]$

Measurement: Overall Diversity

- Is it sensible to add up different diversity forms to get an aggregate or total?
  - No.

- Meaningless under reflective measurement rules
  - Frankendifference
  - Diversity-palooza

- Use separate, distinct measures of diversity
  - Even a formative indicator of "overall diversity" assumes prior-weighted effect on outcome; test instead
  - Even a "simple" combination of gender and race diversity is utterly confusing; gobs of equal combo's
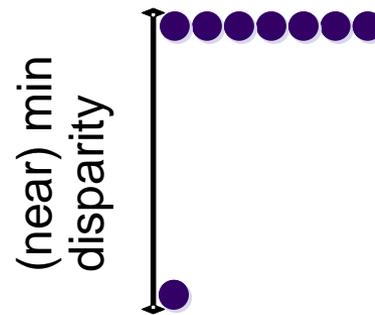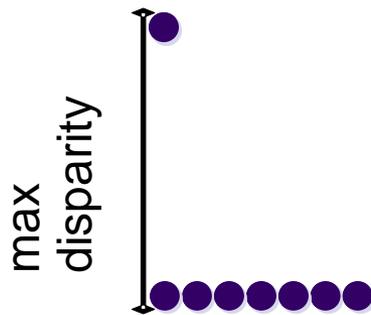
Measurement: Perceived Diversity

- ## Differences of perceptions
  - if perceptions are part of theory (likely as standpoint or form of *separation*), would work as well as any psychological difference
  - still a type of "actual" diversity

- ## Perceptions of differences
  - should be in substantive theory (e.g. HPGF, *AMJ* 2002)
  - if not, tread carefully; perceptions a poor substitute for actual differences:
    - tend to overestimate diff's of outgroup members from ingroup
    - distributional anchors should match the minima ("all of us have equal power") and maxima ("one member has substantially more power than others") of diversity types

Sampling of Diversity

- Must sample some groups at minimum, some groups at maximum, no matter what type

- Need minima at different "spots" for **V**, **S**, **D**

- More restricted the range, the weaker the distinction between types – especially **S** and **D**

  - To test asymmetry assumption of **D** vs. **S**, need some high positive skew and some high negative skew

max disparity

(near) min disparity

Thanks for Attending!!!