

Demographic Correlates of Temperament and Ability

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Purpose of study

- To explore whether demographic measures at the neighborhood level are correlated with personality and/or cognitive ability.
 - Can the personality of residents predict the type of neighborhood in which they live?
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- Best available variable for neighborhoods: U.S. ZIP code
 - “Zone Improvement Plan” code.
 - 5-digit postal code designed for efficient mail delivery.
 - A rough approximation of a neighborhood.

Previous research of personality at different regional levels

- Countries (e.g., Terracciano et al., 2005)
- U.S. regions (e.g., Plaut, Markus, and Lachman, 2002)
- U.S. states (e.g., Rentfrow, Gosling, and Potter, 2008)
- U.S. cities (e.g., Park and Peterson, 2010)
- U.S. ZIP codes (?)

Hypothesis

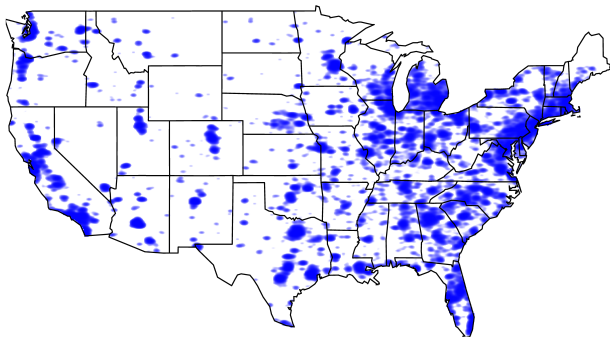
ZIP code population density and ethnic diversity will be positively related to Openness to New Experiences.

- Openness is related to liberalism (McCrae, 1996).
- Big cities tend to be more liberal (Tausanovitch & Warshaw, 2014).
- U.S. liberals self-report that ethnic diversity is an important factor in deciding where to live (Pew, 2014).

Sample size and geographic diversity

Our sample collected between January 2013 April 2015 had:

- 49,160 U.S. participants from
- 11,273 ZCTAs (about 34% of all ZCTAs)
 - ZIP Code Tabulation Area



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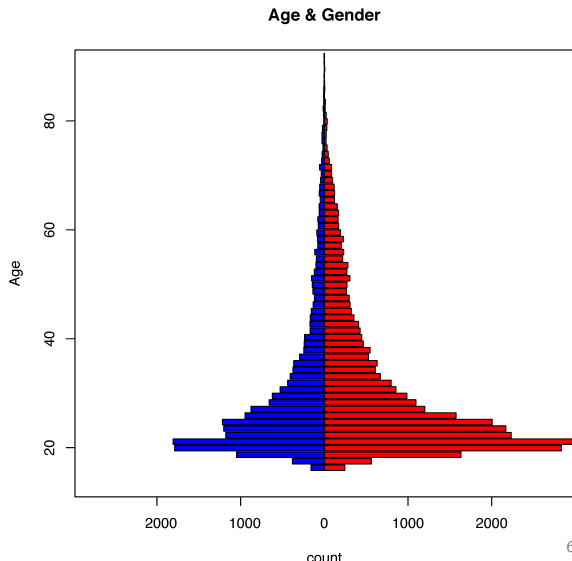
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Sample descriptive stats

- Sex
 - 64% female
- Ethnicity
 - 67% white
 - 10% African American
 - 10% Hispanic
- Age
 - $mean = 26$
 - $sd = 11$
 - $median = 22$
 - $range = 14$ to 90



Measurements

- IPIP-NEO (Big Five and 30 facets)
 - International Personality Item Pool
 - 300 items
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 2. Ethnic diversity (index of fractionalization)
 - The probability that two randomly selected individuals from a ZIP code will be different ethnicities.
 3. Median income
 4. Income disparity (Gini)
 - In the context of ZIP codes, a higher income disparity probably reflects a gentrifying or mixed-income neighborhood, so may be more accurately described as income diversity.

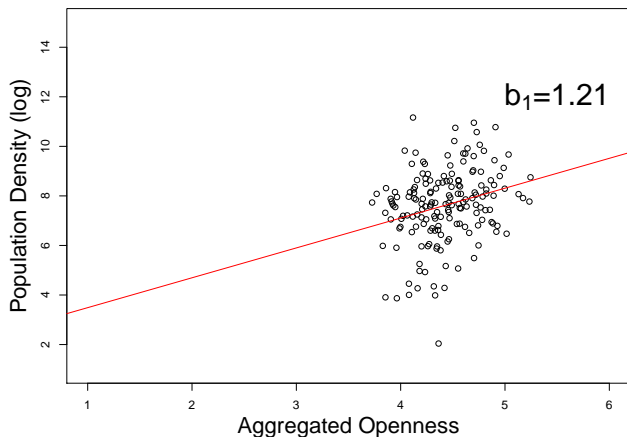
Method of correlation

- Most studies correlate aggregated personality scores with demographic variables.
 - Correlate two “level 2” variables.

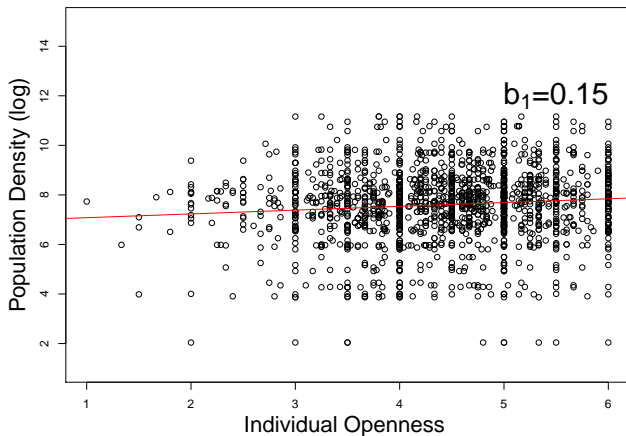
Method of correlation

- Most studies correlate aggregated personality scores with demographic variables.
 - Correlate two “level 2” variables.
- You can also correlate individual personality scores with demographic variables.
 - Correlate one “level 1” variable and one “level 2” variable.
 - This correlation will be attenuated compared to “two level 2’s”.

Example—ZIP code population density and aggregated Openness

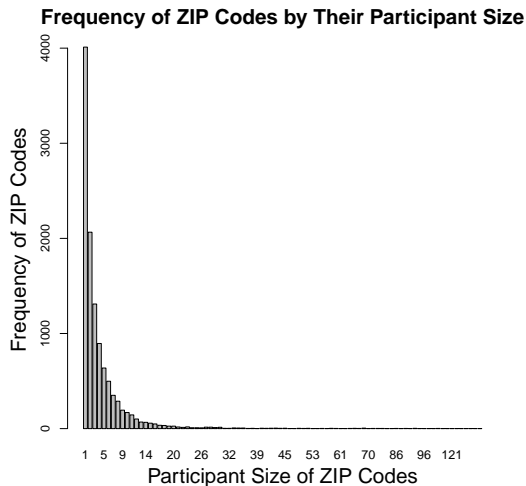


Example—ZIP code population density and individual Openness



Method of correlation

- Correlating two “level 2” variables is recommended.
- But we have an average of 4 participants per ZIP code.
- More than 80% of our ZIP codes have 3 or fewer participants.

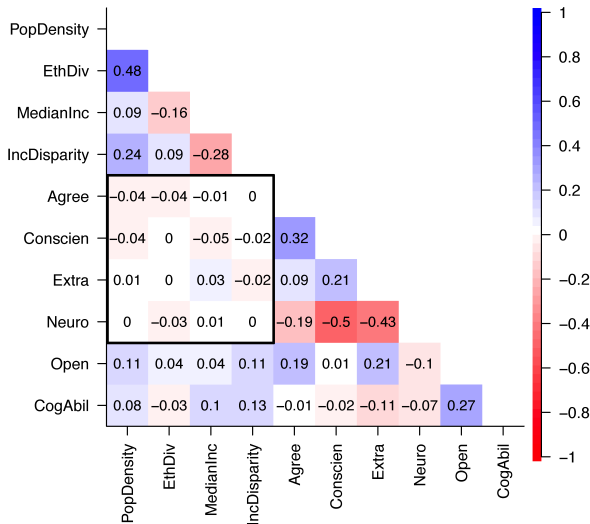


Let's correlate!

- All correlations use individual personality and aggregated ZIP Code demographic variables.
- Standard errors were very small, such that $|r| \geq .04$ could be significant
- We used $|r| \geq .10$ as a cutoff for a noteworthy effect.

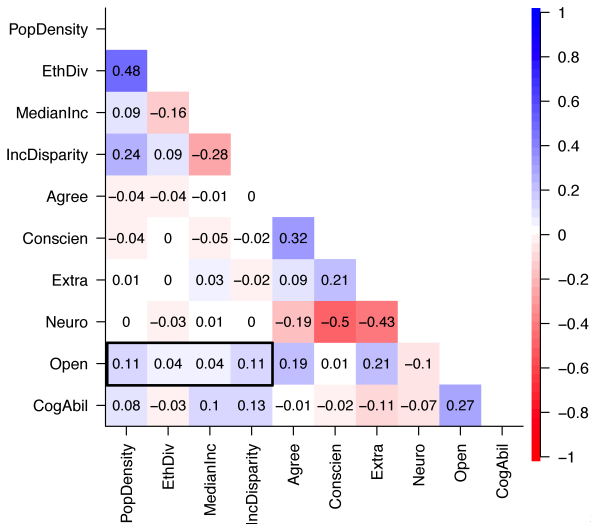
Let's correlate the Big Five!

- None of the other Big Five were correlated with any of the demographic variables.



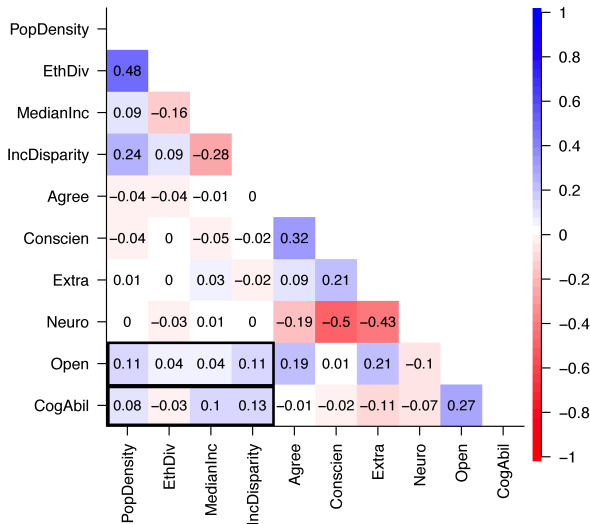
Let's correlate the Big Five!

- Openness
 - + Pop. density
 - ∅ Ethnic diversity
 - ∅ Median Income
 - + Income disparity



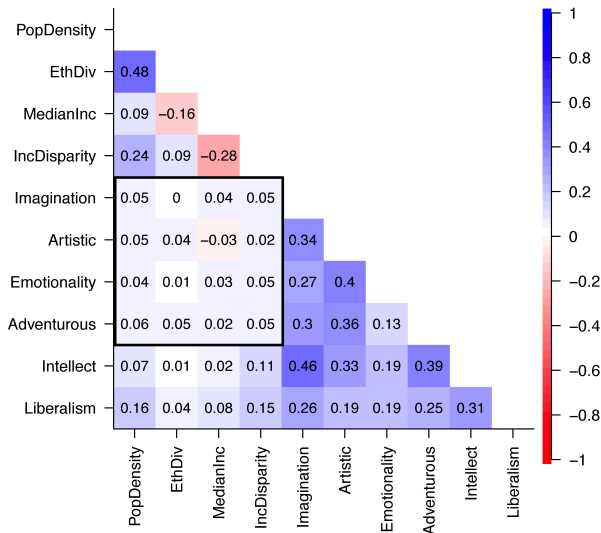
Let's correlate the Big Five!

- Openness
 - + Pop. density
 - \emptyset Ethnic diversity
 - \emptyset Median Income
 - + Income disparity
- Cognitive ability
 - \emptyset Pop. density
 - \emptyset Ethnic diversity
 - + Median Income
 - + Income disparity



Let's correlate Openness facets!

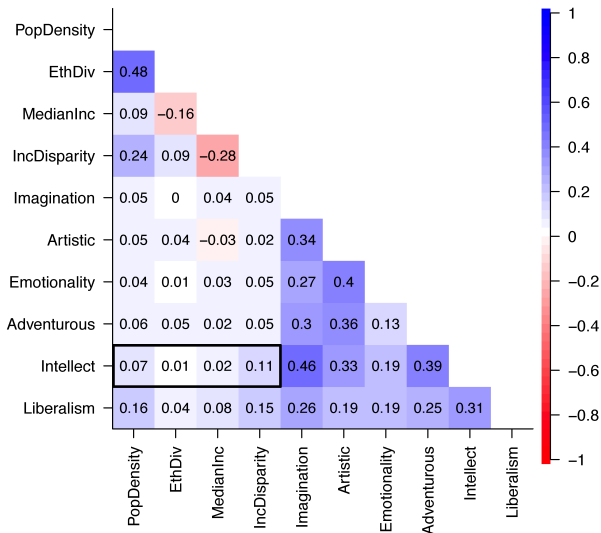
- Four of the six Openness facets were not correlated with any of the demographic variables.



Let's correlate Openness facets!

- Intellect

- ∅ Pop. density
- ∅ Ethnic diversity
- ∅ Median Income
- + Income disparity



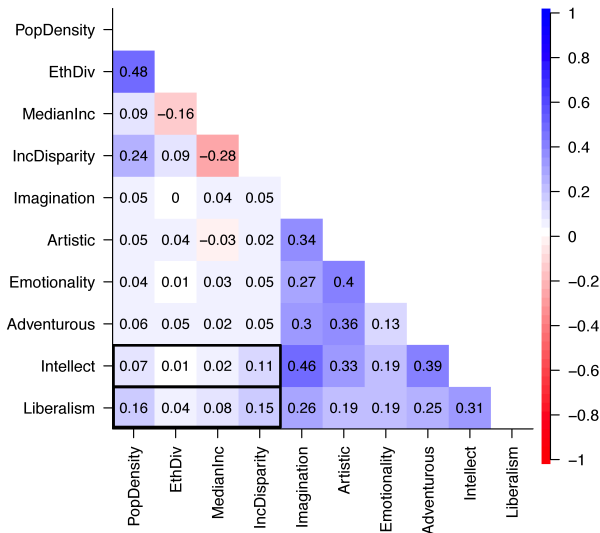
Let's correlate Openness facets!

- **Intellect**

- ∅ Pop. density
- ∅ Ethnic diversity
- ∅ Median Income
- + Income disparity

- **Liberalism**

- + Pop. density
- ∅ Ethnic diversity
- ∅ Median Income
- + Income disparity



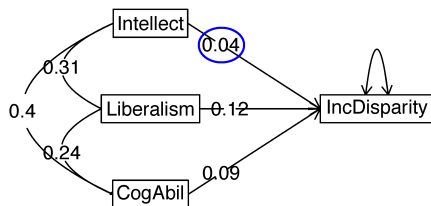
Regression time! (income disparity)

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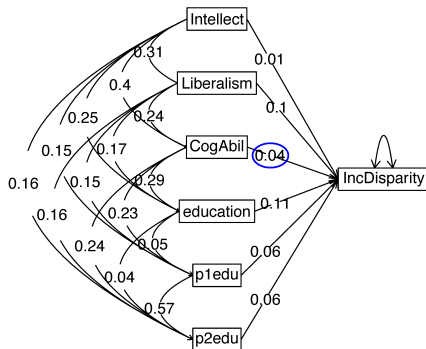
Income disparity regressed onto personality variables



Regression time! (income disparity)

- Income disparity is positively related to:
 - Intellect
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 - Cognitive Ability
- What if they're covariates in a multiple regression model?
- Intellect appears to drop out.
- Cognitive ability also drops out with the inclusion of education in a multiple regression model.

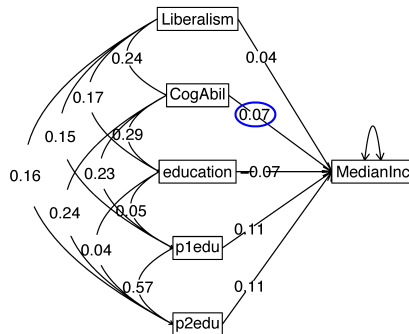
Income disparity regressed onto personality and education variables



Regression time! (median income)

Median Income regressed onto personality and education variables

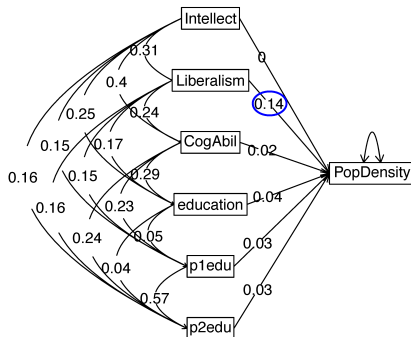
- The correlation of median income and cognitive ability is attenuated with the inclusion of parents' education.



Regression time! (population density)

Population density regressed onto personality and education variables

- Only liberalism appears to have unique variance in predicting population density.



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Table : R of liberalism with demographics, by age

Age Group	PopDensity	IncDisparity
High School	0.11	0.07
Undergrad	0.16	0.16
Adults	0.17	0.15

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Table : R of liberalism with demographics, by gender

- Yes.

Sex	PopDensity	IncDisparity
Female	0.16	0.14
Male	0.16	0.15

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 - These correlations still have unique variance when regressed with covariates.
 - Attenuated in high school students, suggesting directionality; adult liberals choose to live in these neighborhoods.
 - Generalizable for both sexes.
- Not correlated with ethnic diversity.
- U.S. liberals are more likely to live in socially dense and income-diverse, but not ethnically-diverse, neighborhoods.

Conclusions

- Individual-level personality can be correlated with ZIP code level demographic variables.
- However, these correlations are small, but would be larger if we analyzed the data at the aggregate ZIP code level.
- Therefore future research would benefit from analyzing a sample that had a larger number of participants per ZIP code.

Thank You

- Bill Revelle
- David Condon
- Nick Holtzman and Victoria Allen
- And you!

Appendix–Liberalism Items

Table : IPIP-NEO Liberalism Facet Items

Item Number	Item	key
q_345	Believe in one true religion.	-
q_359	Believe that criminals should receive help rather than punishment.	+
q_369	Believe laws should be strictly enforced.	-
q_394	Believe that there is no absolute right and wrong.	+
q_395	Believe that too much tax money goes to support artists.	-
q_397	Believe that we coddle criminals too much.	-
q_398	Believe that we should be tough on crime.	-
q_1328	Like to stand during the national anthem.	-
q_1824	Tend to vote for conservative political candidates.	-
q_1825	Tend to vote for liberal political candidates.	+

Appendix—Measurements

1. IPIP-NEO (Big Five and 30 facets)
 - 300 items
 - 27 items answered per participant (mean)
 - 691 mean pairwise administrations
2. ICAR 60 (cognitive ability)
 - 60 items
 - 15 items answered per participant (mean)
 - 3,176 mean pairwise administrations
3. Population density
4. Ethnic diversity (index of fractionalization)
 - The probability that two randomly selected individuals from a ZIP code will be different ethnicities.
5. Median income
6. Income disparity (Gini)
 - Range of zero to one. A value of zero represents perfect equality (everyone has equal income) and a value of one represents perfect inequality (one person has all income).