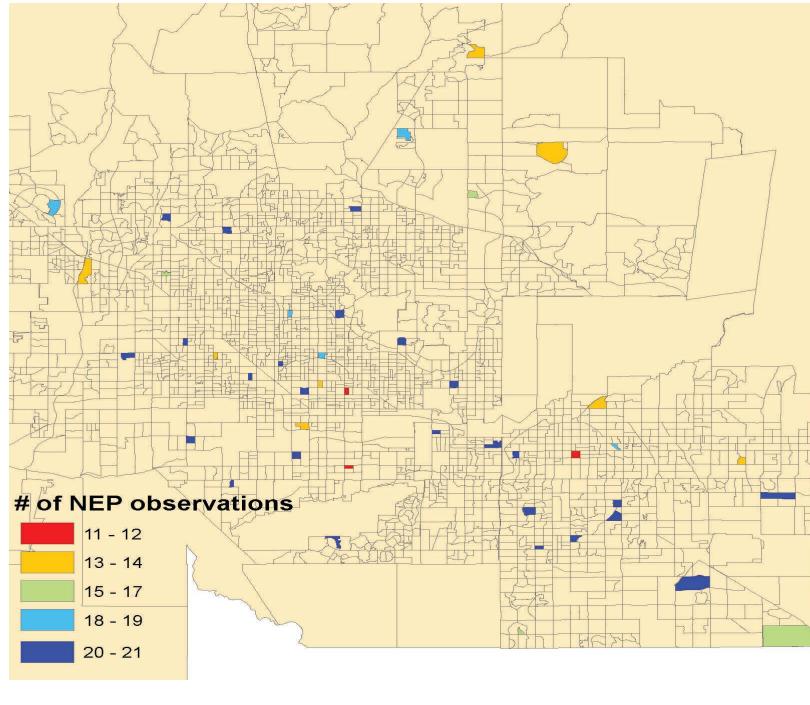
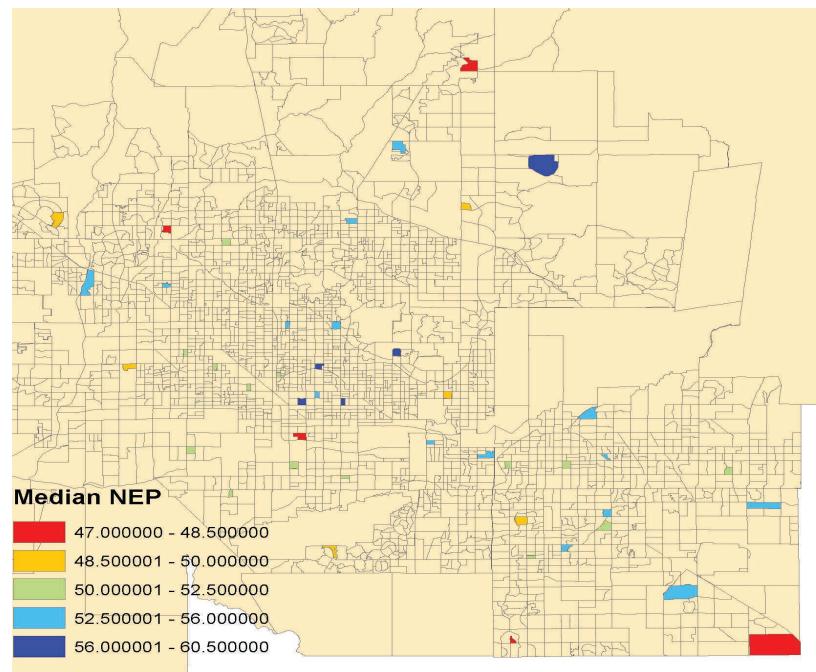
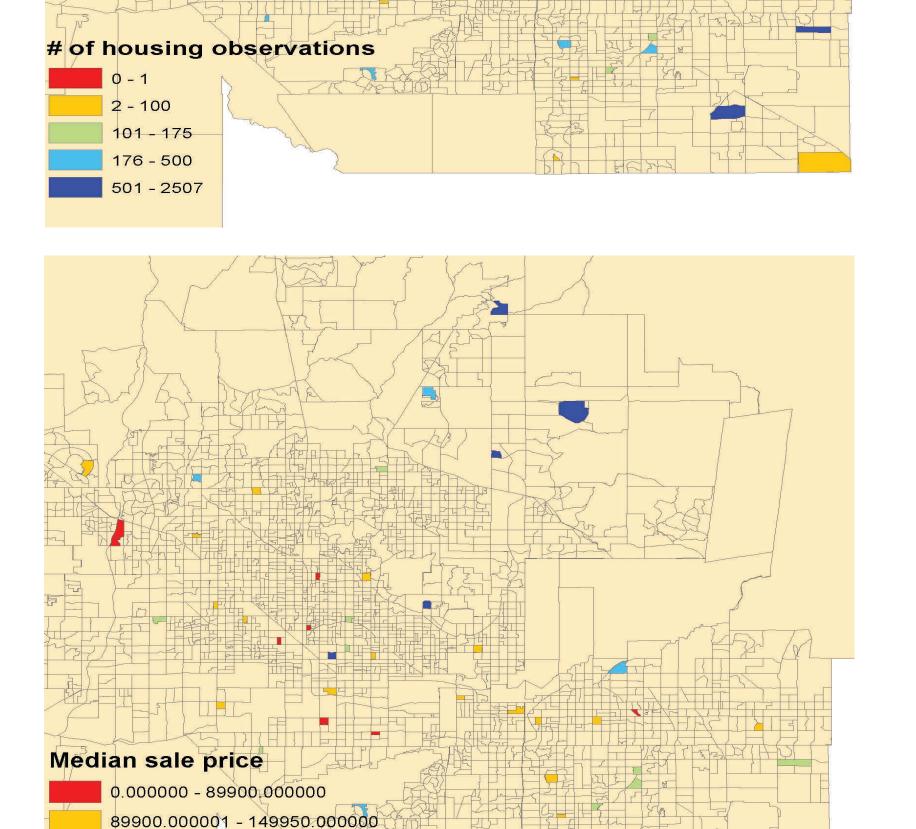
Sorting, Attitude and Preference Alignment for Local Public Goods

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149950.000001 - 220000.000000

220000.000001 - 326791.500000

326791.500001 - 499900.0<mark>000000</mark>

Context

• Samuelson - It is impossible for the market to efficiently allocate local public goods.

- **Tiebout** It is possible for the market to efficiently allocate local public goods given costless sorting in and out of locales is possible.
- Becker Social interaction can be explained as an economic phenomenon.
- Oates At what level of government should public goods be provided? It depends on the characteristics of the public good.
- Kotchen Do people with environmentally friendly attitudes display a higher WTP for environmental amenities? Using contingent valuation studies the answer thus far is yes.

Taken Together

Assuming environmental amenities are local public goods, sorting is possible, and social interaction effects exist, we would expect to see people with similar tastes for local public goods in locales with similar levels of local public goods.

Question

- Are households' attitudes toward ecosystem services consistent with estimates of economic tradeoffs to enhance these services?
- In other words, do we observe demographic and attitudinal differences in local populations that correlate with price indices of local public goods i.e. sorting?

Hypothesis

People with pro-environmental attitudes sort into places with higher levels of local public goods.

New Ecological Paradigm (NEP)

- First developed in 1978 by Dunlap and Van Liere, called the New Environmental Paradigm.
- Updated in 2000 and changed its name to the New Ecological Paradigm.
- 15 statement Likert scale that measures pro-environmental attitudes.
- 15 statement is considered the "full" NEP, but many studies have used less than 15 statements, normally between 5 and 7.
- This will serve as a measure of attitudinal differences.

SA^{c} MA U MD SD (N) r_{i-t} 27.7% 25.2% 21.0% 16.0% 10.0% (667) .43 of the number of people the earth can support 2. Humans have the right to modify 4.1 28.5 9.2 33.9 24.3 (663) .35 3. When humans interfere with nature 44.6 37.6 4.0 11.2 2.5 (668) .42 consequences 4. Human ingenuity will insure that we 7.8 23.5 21.5 24.4 22.7 (664) .38 do NOT make the earth unlivable 5. Humans are severely abusing 51.3 35.3 2.6 9.3 1.5 (665) .53 the environment 24.4 34.8 11.3 17.5 11.9 (663) .34 6. The earth has plenty of natural resources if we just learn how to develop them 7. Plants and animals have as much 44.7 32.2 4.7 12.8 5.7 (665) .46 right as humans to exist 8. The balance of nature is strong 1.1 7.4 11.3 30.9 49.4 (664) .53 enough to cope with the impacts of 9. Despite our special abilities humans 59.6 31.3 5.4 2.9 0.8 (664) .33 are still subject to the laws of nature 10. The so-called "ecological crisis" 3.9 17.9 13.8 25.9 38.5 (665) .62 facing humankind has been greatly exaggerated 11. The earth is like a spaceship with 38.0 36.3 7.5 13.4 4.8 (664) .51 very limited room and resources 12. Humans were meant to rule over 13.5 20.4 8.2 23.9 34.0 (661) .51 the rest of nature 13. The balance of nature is very delicate 45.9 32.8 5.9 14.1 1.4 (665) .48 and easily upset 14. Humans will eventually learn enough 3.2 20.1 24.2 27.9 24.6 (666) .35 about how nature works to be able to 15. If things continue on their present 34.3 31.0 16.9 14.1 3.6 (667) .62 course, we will soon experience a major ecological catastrophe

^aQuestion wording: "Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you STRONGLY AGREE, MILDLY AGREE, are

^bAgreement with the eight odd-numbered items and disagreement with the seven even-numbered items

^cSA = Strongly Agree, MA = Mildly Agree, U = Unsure, MD = Mildly Disagree, and SD = Strongly

UNSURE, MILDLY DISAGREE or STRONGLY DISAGREE with it."

Table 1. Frequency Distributions and Corrected Item-Total Correlations

for New Ecological Paradigm Scale Itemsa

Data Development

1) Phoenix Area Social Survey (2011)

- Full NEP and demographic variables for the 45 PASS neighborhoods - Several subsets of "Full" NEP created to match subsets used by Kotchen, and the subset from the 2006 PASS

2) Phoenix Area Social Survey (2006)

- Subset of NEP (only 4 statements) matched to respondents from 2011 PASS 3) Spatially located housing data from Dataquick

- Only houses in a PASS neighborhoods were kept 4) Local public goods variables

- Temperature and a wet/dry dummy based on satellite images of landscape from Klaiber, Smith 2011, AERE >> Other variables were available but due to the small sample size (45 neighborhoods) many were omitted - School test averages from 2003-2007 (Arizona Department of Education) - PM10 and air quality index measures of closest monitor to a PASS neighborhood(EPA)

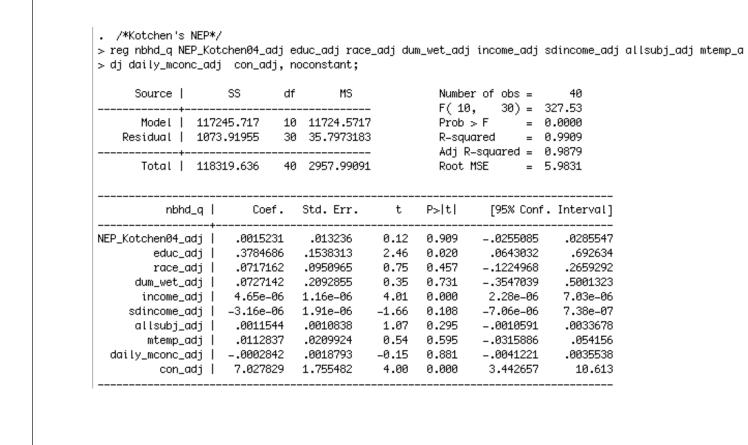
All housing data observations were matched to specific PASS observations by parcel number. All public goods variables were matched spatially using ARCGIS, with the exception of school test scores, which were matched by district name.

Two datasets are created. One contains all housing sales from 1998 to 2006 that are within a PASS neighborhood. In addition, if any one of the PASS houses sold within 1998 to 2006, that sale was matched with the PASS respondent living in that parcel. The other dataset contains the exact same variables, except that it contains every housing sale in a PASS neighborhood from 1998 to 2011.

Get neighborhood price indices

- $\ln(price) = \beta_1 sqft + \beta_2 lot \ acres + \beta_3 stories + \beta_4 bathrooms + \beta_5 age + \beta_6 has \ garage +$ $\beta_7 has pool + \beta_8 rooms + \beta_9 sqft^2 + \beta_{10} acre^2 + \beta_{11} age^2 + YearFE + NbhdFE$
- This takes advantage of the matching between the PASS and housing data to get price indices for each neighborhood, and controls for temporal market changes in housing prices

> reg nbhd_q NEP_adj educ_adj race_adj dum_wet_adj income_adj sdincome_adj allsubj_adj mtemp_adj daily_m > conc_adj con_adj, noconstant; Source | SS df MS Number of obs = 40 Model | 117383.084 10 11738.3084 Residual | 936.55217 30 31.2184057 R-squared = 0.9921 Adj R-squared = 0.9894 Total | 118319.636 40 2957.99091 nbhd_q | Coef. Std.Err. t NEP_adj | .0140416 .0066824 2.10 0.044 .4376718 .1388254 3.15 0.004 .0226279 .0912607 0.25 0.806 dum_wet_adj | -.0242476 .2007826 -0.12 0.905 -.4343003 4.42e-06 1.07e-06 4.12 0.000 2.23e-06 6.61e-06 sdincome_adj | -2.96e-06 1.77e-06 -1.67 0.105 -6.58e-06 6.59e-07 allsubj_adj | .0010691 .0010113 1.06 0.299 -.0009963 .0031345 .017576 .0192732 0.91 0.369 -.0217852 .0569372 daily_mconc_adj | -.0002187 .0017026 -0.13 0.899 -.0036958 .0032584 con_adj | 5.821905 1.701542 3.42 0.002 2.346893 9.296917



Conclusion

Using a full or partial NEP matters. This could only be true for small samples (n=40) but merits further investigation.

There is a significant positive correlation between NEP and neighborhood quality.

This result does not seem to persist over time with this sample. However that could be due to the fact that only a subset of the NEP was asked in 2006, and that the sample has not been consistent, nor random, over this time period-- 5 new neighborhoods were added in 2011, and the neighborhoods are not selected randomly.

There is a significant positive correlation between mean income and neighborhood quality.

This result does persist over time and changes in the sample, which lends further support to the concept of social interactions.

Attitudes are important, and a means of predicting economic behavior. Much more research clearly needs to be done, but these results serve as a proof of concept.

Stage 2 -Attempt to explain observed price indices

- Adjust all variables for estimation error to control for nonspherical errors by using a cholesky decomposition on the variance covariance matrix from stage 1
- $NBDHFe = \gamma_1 NEP + \gamma_2 mean \ test \ scores + \gamma_3 education + \gamma_4 race + \gamma_5 house \ wet +$ γ_5 income + γ_6 s. d. Income + γ_7 mean temp. + γ_8 mean conc. PM10 + constant

Source	l	SS	df	MS						
Model		 40628.223					F(10, Prob > F			
Residual	1	151.24067 	25	46.04962	67		R-squared			
		 41779.463					Adj R-squ Root MSE			
	. –									
nbhd_	 -q	Coef.	St	d. Err.	t	P> t	[95	 % Conf.	Interval]	
NEP1106_a	+ j	.0137357		.022284	0.62	0.54	3 30	 32159	.0596304	
		.2753059							.5584252	
		.0761612		971725		0.44	112	39693	.2762918	
dum_wet_a	j ∣	.1066749	.2	2149272	0.50	0.62	433	59759	.5493257	
income_a	ქj	4.29e-06	1.	.06e-06	4.06	0.00	0 2.1	1e-06	6.46e-06	
sdincome_a	j ∣	-2.67e-06	1.	.77e-06	-1.51	0.14	4 -6.3	1e-06	9.77e-07	
allsubj_ad	ijĺ	.0014207	.0	0010709	1.33	0.19	700	07848	.0036262	
mtemp_ad	ijĺ	.0342893	.0	3213424	1.61	0.12	100	96661	.0782447	
daily_mconc_ad	ქj	.0002487	.0	0016409	0.15	0.88	100	31307	.0036282	
con_ac	ii l	4.899662	1.	.834529	2.67	0.01	3 1.1	21378	8.677945	

Source	SS	df MS	i				
	 140649.506				10, 25) = b > F =		
Residual 1129.9573					quared =		
•				_	R-squared =		
Total	141779.463	35 4050.84	181	Roo	t MSE =	6.723	
nbhd_q	Coef.	Std. Err.	t	P> t	 [95% Conf.	Interval]	
y06NEP_adj	-+ .0119787	.0129322	0.93	0.363	0146555	.038613	
	.3132198				.0135772	.6128623	
race_adj	.0613407	.0980632	0.63	0.537	1406244	.2633057	
dum_wet_adj	.089869	.2124711	0.42	0.676	3477234	.5274615	
income_adj	4.22e-06	1.05e-06	4.03	0.000	2.06e-06	6.37e-06	
sdincome_adj	-2.45e-06	1.77e-06	-1.39	0.178	-6.10e-06	1.19e-06	
allsubj_adj	.0010535	.0011566	0.91	0.371	0013285	.0034355	
mtemp_adj	.032733	.0210814	1.55	0.133	0106848	.0761509	
daily_mconc_adj	0000932			0.956	0035732	.0033868	
con_adj	5.095707	1.758801	2.90	0.008	1.473389	8.718024	

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