



# Can where you live affect how you think?

## Public perceptions of climate change and water scarcity in Phoenix, AZ



Jason Loose, Amber Wutich

School of Sustainability  
Arizona State University  
Decision Center for a Desert City

School of Human Evolution and Social Change  
Arizona State University  
Decision Center for a Desert City

This research examines the sources of difference in local ecological knowledge (LEK).

- Does length of residency in Phoenix, AZ, affect knowledge of local climate change and water scarcity?
- Is knowledge in rural neighborhoods different from that in urban ones?
- *Local ecological knowledge*: what residents know and think about local ecological conditions such as climate change.
  - Helps determine the actions they take that affect their environment.
  - Complements scientific observations of ecological conditions/problems (Olsson & Folke, 2001).

Residents' LEK was recorded in face-to-face interviews.

• We interviewed 30 residents each at a rural site and an urban site, and recorded their LEK of climate change and water scarcity using a free-list method (Brewer, 2002).

### Questions for respondents:

1. Do you perceive climate change in Phoenix?
2. If so, what signs do you perceive that the climate is changing?
3. Do you think your community will always have enough water?
4. If not, why not? Please list all the reasons you can think of.

• Statistical hypothesis testing and graphic comparison help us compare residents' LEK and test for significant differences.

- Our independent variables for comparison:
  - Length of residency in Phoenix (more than 15 years vs. less than 15 years)
  - Neighborhood type: Urban residents vs. rural residents

### Two sample neighborhoods



Longtime residents appear much more likely to perceive local climate change.

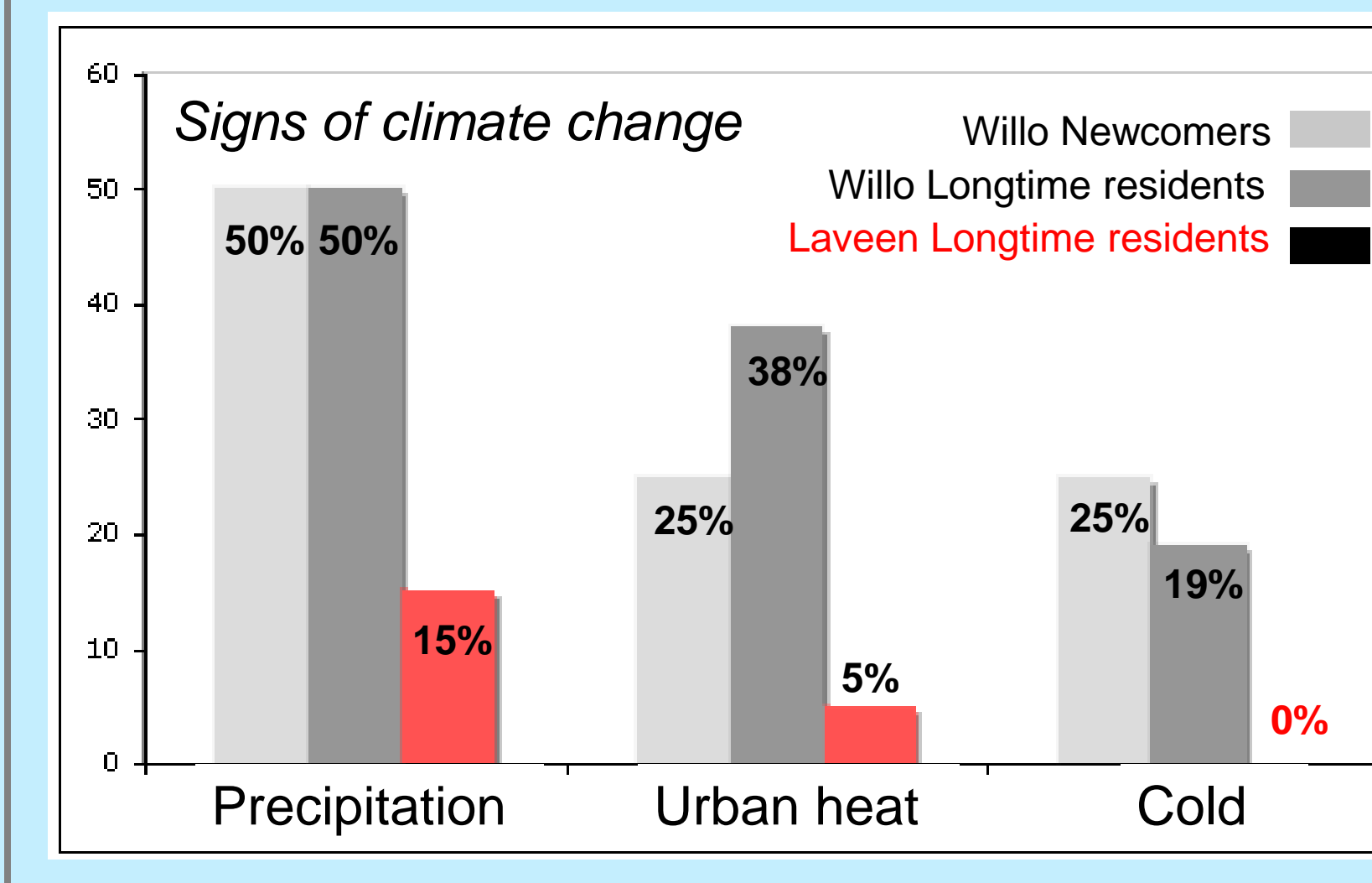
	Newcomers in Willo (n=13)	Longtime residents in Willo (n=17)	
Believe in climate change	54%	94%	$p = .025$
Predict water scarcity	54%	82%	$p = .218$

Urban residents also appear much more likely to perceive local climate change.

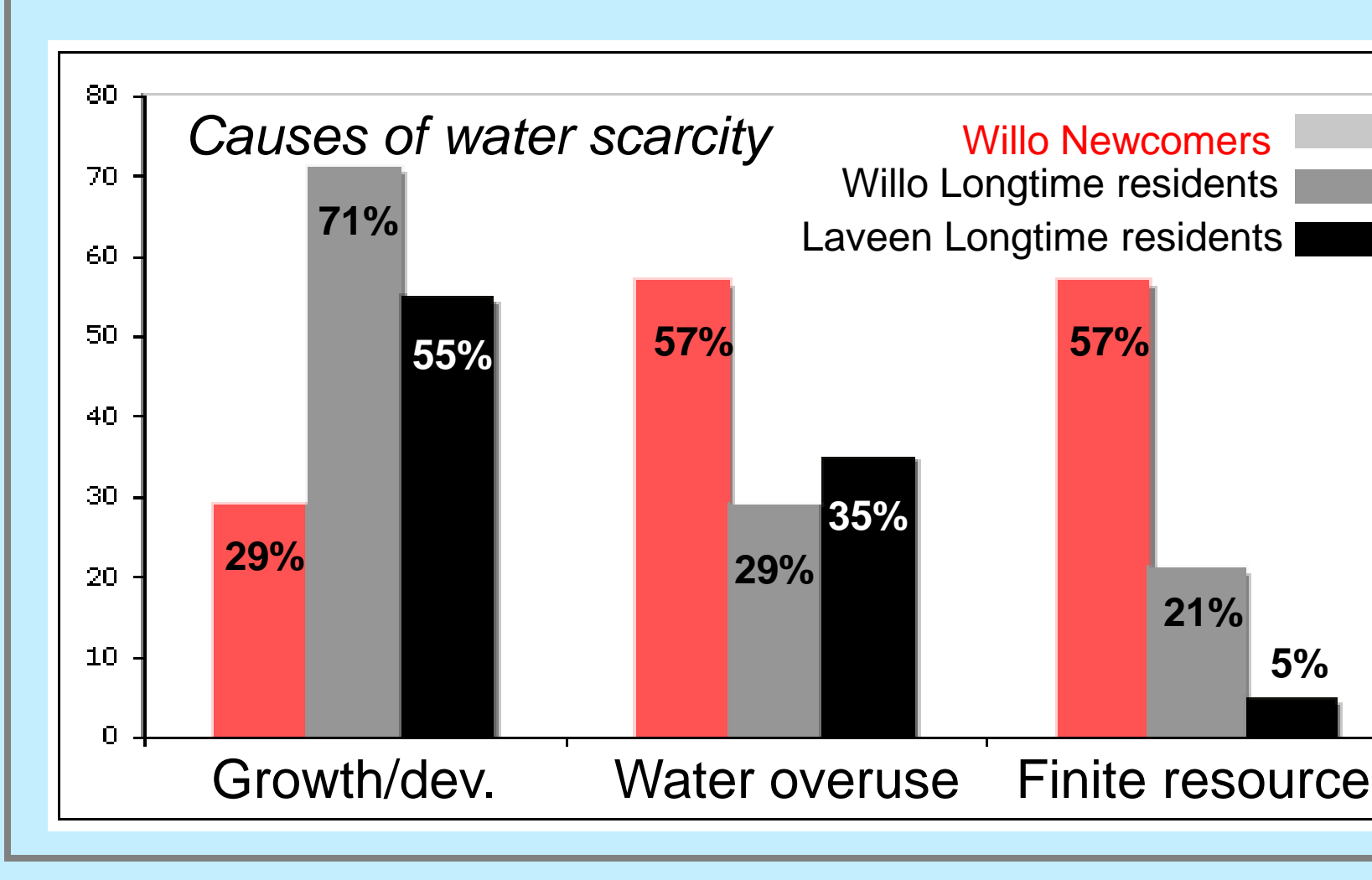
	Willo longtime residents (n=17)	Laveen longtime residents (n=27)	
Believe in climate change	94%	59%	$p = .029$
Predict water scarcity	82%	63%	$p = .198$

Neither variable appears to significantly affect prediction of water scarcity.

Both length of residency and neighborhood type appear to affect perceived signs of climate change and causes of water scarcity.

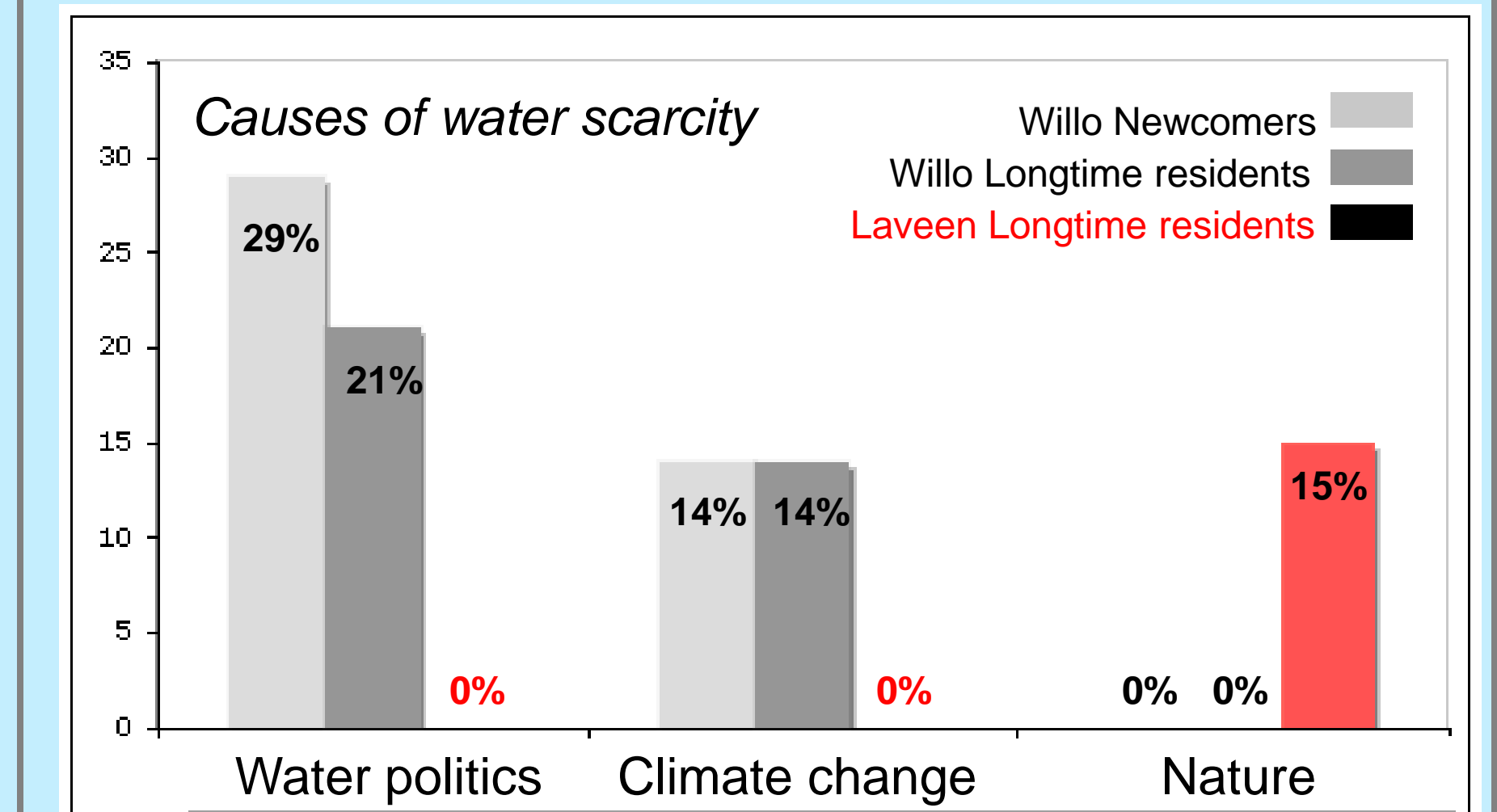


Rural residents are less likely to see decreased precipitation, urban heat, and colder winters as signs of climate change.



Newcomers are less likely to see development as a cause of water scarcity, and attribute it more to water overuse and finite resources.

\*Statistical testing is inappropriate here due to low sample size.



Rural residents are less likely to see interstate water politics and climate change as causes for water scarcity, and attribute scarcity more to nature.

- All respondent groups also perceived hotter temperatures, air pollution, and humidity as signs of climate change.
- All respondent groups also perceived present water scarcity as a cause for future water scarcity.

This research aids in understanding how urbanization affects LEK in Phoenix and other water-scarce cities.

• These preliminary findings suggest that Phoenix, a city with rapidly-growing populations and scant water supplies, is acquiring many new residents who think about the city's ecological footprint differently.

– Many other growing cities in the U.S. Southwest and the world share the problem of low water availability and changing climate, and may need to adapt to newcomers who have a different level of LEK than longtime residents.

• Research like this may also help water policymakers and other experts to identify demographic groups' differing LEK and target them differently for public outreach.

• This would help them to better serve and educate the growing public.

### References

- Brewer, D.D. (2002). Supplementary Interview Techniques to Maximize Output in Free Listing Tasks. *Field Methods*, 14(1), 108-118.
- Olsson, P., & Folke, C. (2001). Local Ecological Knowledge and Institutional Dynamics for Ecosystem Management: A Study of Lake Racken Watershed, Sweden. *Ecosystems*, 4(2) 85-104.

### Acknowledgment

We thank Paul Westerhoff (Civil, Environmental and Sustainable Engineering, Arizona State University), and Beatrice Crona (Stockholm Resilience Center, Stockholm University), who served as co-investigators on the larger project that made this research possible. Thanks to Zeenat Hasan for data collection and advice, and to the COURs seminar for a great deal of support, education and much-needed critique. Thanks also to Patricia Gober, Charles Redman, and other faculty at the Decision Center for a Desert City who helped make this research and its parent project possible. This material is based upon work supported by the National Science Foundation under Grant No. SES-0345945 Decision Center for a Desert City (DCDC). Any opinions, findings and conclusions or recommendation expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).