Individually Experienced Temperatures and Sense of Place: An exploration of the social construct and its relationhip to personal heat exposure.

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Abstract

Sense of Place (hereafter SoP), a multidimensional construct of emotional and cultural attachment to a specific geographical location, can highly influence people's behaviors and attitudes regarding the activities they carry out day by day.[5] These activities determine time spent outside and can therefore affect personal exposure to heat, an excess of which can have adverse effects on health[1,2]. The level of Sense of Place and the extent to which it influences IETs (Individually Experienced Temperatures)[4] was studied in two neighborhoods in Phoenix: Thunderhill (TH), an Ahwatukee residential community, and Coffelt-Lamoreaux (CO), a public housing project in Central City South. IETs were analyzed and contextualized with qualitative Sense of Place data gathered through surveys and interviews. TH residents presented a high level of Sense of Place, while residents of CO had very low levels. In terms of IET, TH participants had lower average daily and all hours averages and CO participants recorded marginally higher average daily and all hours IETs.

Data collected suggests that participants from both neighborhoods spend considerable amounts of time outdoors, thus increasing heat exposure, but the motive (leisure vs. necessity) behind exposure to heat makes a difference in whether those participants feel positively or negatively about the spaces they move through. These findings will help us further understand human-environment interactions, as well as social complexity in urban areas.

Coffelt-Lamoreaux

Thunderhill

Methods

Thermochron iButton temperature sensors were distributed to participants in TH and CO and used to record air temperatures for a week in September 2014. Participants were asked to carry their iButton at all times to measure IETs. In addition, participants…

- Filled out daily surveys regarding comfort levels and personal temperature experiences.
- Completed background information surveys.
- Participated in a final semi-structured interview.

Responses were coded and ranked in a scale of 1-4: 1 is minimum attachment or SoP, and 4 is high attachment or SoP. The SoP ranking was assigned primarily through the existing ranking in the background surveys and the questions regarding neighborhood interactions, answers ranging from "Strongly Disagree" = 1, to "Strongly Agree" = 4. For the interviews, coding was realized through the analysis of patterns in the participants' comments. Comments about their communities and activities within it including words with positive, negative, and neutral connotations were identified and quantified on frequency. An average of the sum of the background survey answers and coded answers found in the interviews determined the level of SoP for each participant. To pair with the newly formed ranking of SoP, a week's worth of IETs for each participant was collected and analyzed for SoP-IET correlation significance.

Results

For Sense of Place analysis, we found that residents of TH have a higher level of SoP, whereas in CO a very low SoP was present.

IETs in TH were also slightly lower than the ones registered in CO (See Tables 1 and 2).

8 individuals participated; 4 from each neighborhood.

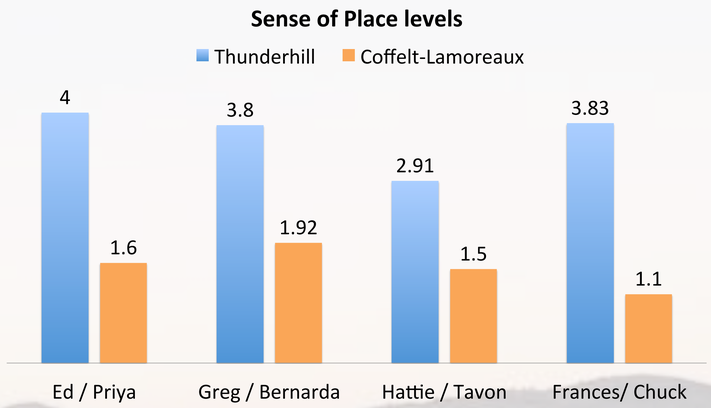

Figure 1 – Sense of Place levels of participants of CO & TH.

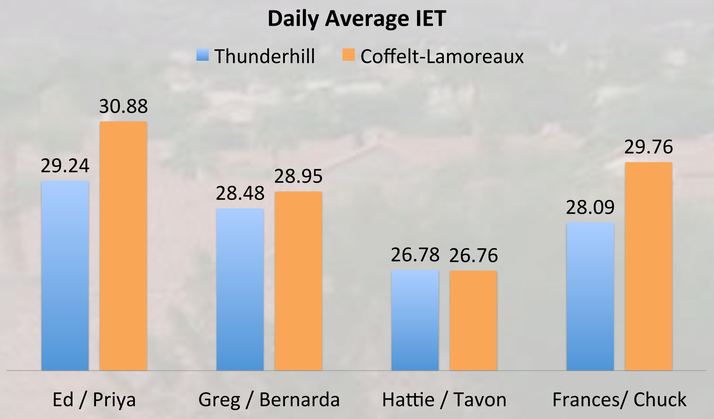

Figure 2 – Daily Average IET of participants of CO & TH.

Data collected suggests that participants from both neighborhoods spend considerable amounts of time outdoors, thus increasing heat exposure, but it is the motive behind each exposure to heat that makes a difference.

Physical components of a neighborhood, such as availability of cooling resources and green spaces can influence sense of place through physical comfort, but the social fabric of a community seems to be stronger in eliciting positive or negative attitudes that drive people to engage in activities in a specific area.

"It's a real close-knit neighborhood, we do stuff together […]. Usually at some point somebody's out walking so they're watching out for each other." – TH resident

"It's the people, you know? They don't want to get along. We all live in the same community and they don't want to, like, help each other." – CO resident

Conclusions

Sense of Place highly influences people's decisions and attitudes towards heat exposure, as it becomes contextual; it becomes part of a positive or negative picture, depending on one's regards for the environment in which one dwells. This observation brings a question of health and safety. A recent study has shown that people that live in isolation are more vulnerable to health risks than people that are actively social in their communities, as a network is created and might be available to help in times of strife[3]. This attitude of isolation corresponds to a low SoP level, which several participants of this study presented. For reasons such as the aforementioned, a reasonable idea to propose to residential community developers would be to be aware of SoP-fostering drivers that would allow for healthy relationships among neighbors and with their physical environment. Periodical community meetings, recreational activities, collaborative heat mitigation and emergency response strategies, etc. would be some of the projects that could aid a neighborhood in its SoP growth.

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Parks in CO (Left) and TH (Right), where community activities for SoP growth could take place

For multi-scalar studies, it is important to find commonalities and contrasts when analyzing results and coming to conclusions. With this in mind, it is not likely for results to look homogeneous and yield neighborhood-scale results of IET-SoP correlation if populations and datasets are limited. Shared feelings of SoP and broader common activities leading to heat exposure might be seen with larger populations of a delimited area, pointing to a more general SoP within larger structures, like cities.

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Acknowledgements

- Central Arizona Phoenix Long-Term Ecological Research Program (CAP LTER)
- ASU Center for Policy Informatics
- Natural Hazards Center at University of Colorado Boulder
- Dr. Sharon Harlan and Dr. Ben Ruddell
- Research Participants
- IET Research Lab Teammates: Summer Betzel, Christopher Dastan, Jason Eneboe, Miranda Kaml, Lauren Rohan-Kohl, Mara Sevig, Marianna Singh