Revealing hidden perceptions of SuDS through Implicit Association Tests

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Water Sensitive Urban Design

"Room for the River"

BLUE- GREEN

Sponge City

海绵城市

海绵城市是指城市能够像海绵一样，在适应环境变化和应对自然灾害等方面具有良好的“弹性”，下雨时吸水，蓄水、渗水、净水，需要时将蓄存的水“释放”或加以利用。
The challenges

- Socio-political barriers typically exert the strongest negative influence on widespread implementation of (blue-green) SuDS
Downscaling climate projections

Climate change Modelling
Impacts of climate change
Natural hazards
Engineering uncertainty
Existing infrastructure
Retro-engineering
Downscaling climate projections

Biophysical

Competing priorities

Governance Partnerships and collaboration
Institutional capacity/expertise
Political leadership
Legislation, regulations
Statutory standards
Inter-agency working
Champions
Adoption

Communication
Responsibility
Stewardship
Ownership
Resilience
Awareness
Cost
Funding

Multiple benefits
Risk (cost/performance)
Available space

Maintenance

Knowledge

Perceived ‘novelty’

Socio-political

Population and demographic change
Public preferences
Economic/urban development
Responses to climate change impacts
Culture
Education

Uncertainties and barriers to the implementation of Blue-Green infrastructure

Funding
Cost
Retro-engineering

Partnerships and collaboration

Institutional capacity/expertise

Governance

Inter-agency working

Public preferences

Socio-political

Perceived ‘novelty’

Education
The challenges

- Socio-political barriers typically exert the strongest negative influence on widespread implementation of (blue-green) SuDS

- SuDS are often highly visible ("novel?") interventions that require support from residents and local Government to be effectively implemented and maintained

- Positive public perceptions are key to generating greater levels of awareness, acceptance, value and stewardship

- Perceptions of residents living in close proximity (and wider?) to SuDS are poorly understood
Public perceptions of SuDS: Typically evaluated by explicit (self-report) measures e.g. questionnaires, Likert scale tests, feeling thermometers, interviews

- **Aesthetics**
  - Blue-Green environments seen as attractive, good for wellbeing, positive streetscapes, desirable places to live
  - Concerns over litter, untidiness, mess (plant choice and maintenance)

- **Wildlife**
  - Creation of new habitat and wildlife (e.g. birds, animals) is highly valued
  - Risk of insects

- **Safety**
  - Concerns over safety of open water, steep sides and plants obscuring depressions (visual obstruction for drivers – street bioswales Portland*)
  - Perceived insect (mosquito) risk with wet features

- **Function**
  - Limited awareness of (local and wider) functionality: no strong opinions on drainage features in public realm, just viewed as ‘greenspace’?
  - Less awareness of co-benefits (e.g. carbon sequestration, reducing air pollution)

*Everett et al., 2018. Journal of Flood Risk Management*
Interactive poll 1: Blue-green vs. grey

Source: https://www.susdrain.org/delivering-suds/using-suds/suds-components/retention_and_detention/retention_ponds.html

Source: https://www.portlandoregon.gov/bes/article/201850

Go to www.slido.com and enter the event code #3274
Interactive poll 2: greenspace with SuDS vs. greenspace without SuDS

Interactive poll 3: which do you think is more attractive? greenspace with SuDS vs. greenspace without SuDS
Advantages of implicit measures

Implicit Association Tests can help reveal how people feel about SuDS, moving beyond stated preferences and improving our understanding of implicit and explicit perceptions.

<table>
<thead>
<tr>
<th>Explicit measures</th>
<th>Implicit measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Deliberate</td>
<td>• Automatic</td>
</tr>
<tr>
<td>• Conscious</td>
<td>• Subconscious</td>
</tr>
<tr>
<td>• Introspective</td>
<td>• Associative</td>
</tr>
<tr>
<td>• Self-report</td>
<td>• Reaction time (response latency)</td>
</tr>
<tr>
<td>• Assumes an individual knows and can articulate their beliefs</td>
<td>• Not dependent on participants’ awareness of the strength of associations</td>
</tr>
<tr>
<td>• Influenced by external factors</td>
<td>• Not affected by external influences</td>
</tr>
<tr>
<td>• Potential bias (social desirability, self-enhancement, self-ignorance), purposefully or inadvertently</td>
<td>• Less bias, hard to ‘fake’ results</td>
</tr>
<tr>
<td>• N/A</td>
<td>• Reaction times can be affected by age, understanding of images and words (target concepts), external distractions</td>
</tr>
</tbody>
</table>
Implicit Association Test (IATs): method

Comparing reaction times to different pairings of **target-concept** (greenspace with SuDS vs. greenspace without SuDS) and **attribute** (positive and negative words) stimuli presented on a computer screen (5 blocks, 2 tests)

SuDS  
(Press ‘E’ key)  

No SuDS  
(Press ‘l’ key)  

Block 1. Initial target-concept discrimination
Positive
(Press ‘E’ key)

Negative
(Press ‘I’ key)

Beautiful

Block 2. Evaluative attribute discrimination
Positive / SuDS

(Press ‘E’ key)

Negative / No-SuDS

(Press ‘I’ key)

Block 3. Initial combined task
Blocks 4 and 5. Reversed target-concept discrimination and reversed combined task
Preferences for SuDS in Bristol (method trial 2018)

Investigating preferences for public greenspace with SuDS vs. greenspace without SuDS. IAT and two explicit tests. Evaluative attributes: attractiveness, safety, tidiness

**Feeling thermometer**

100 — Extremely safe

0 — Extremely unsafe

*We would like to indicate on this scale how safe you feel these public open space are?*

*Draw an X at whichever point on the scale best indicates your feelings.*

**Likert scale**

*Draw a cross on the line that shows how far you agree with each of the statements below.*

1. I would like to live close to these types of public green space

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither disagree nor agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

2. I would like more places like this where I live

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither disagree nor agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

3. I would like to spend time in these types of public green space

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither disagree nor agree</th>
<th>Agree</th>
<th>Strongly agree</th>
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</thead>
</table>
Preferences for SuDS in Bristol (method trial 2018, n=44)

- No overall **implicit** preference for SuDS or no-SuDS in public greenspace
- Overall **explicit** preferences for greenspace without SuDS in both tests
- No significant correlation between the implicit and explicit scores
  - Typical for socially sensitive, controversial topics or if explicit tests are biased
  - Fundamental difference between implicit and explicit attitudes?
  - Or people don’t have a pre-formed implicit attitude towards SuDS?

![Graph showing scatter plots of Feeling thermometer vs. IAT score and Likert test vs. Feeling thermometer.]
More insight from the preferences of individual respondents

- 7% both explicitly and implicitly prefer greenspace with SuDS
- 18% both explicitly and implicitly prefer greenspace without SuDS

Comparing IAT and feeling thermometer

<table>
<thead>
<tr>
<th>Category</th>
<th>With SuDS (explicit)</th>
<th>Neutral (explicit)</th>
<th>Without SuDS (explicit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With SuDS (implicit)</td>
<td>7</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Neutral (implicit)</td>
<td>16</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Without SuDS (implicit)</td>
<td>18</td>
<td>11</td>
<td>18</td>
</tr>
</tbody>
</table>
More insight from the preferences of individual respondents

41% of respondents *implicitly* prefer greenspace with SuDS

21% of respondents *explicitly* prefer greenspace with SuDS

Comparing IAT and feeling thermometer
With SuDS (explicit) | Neutral (explicit) | Without suDS (explicit)
---|---|---
7 | 9 | 5
11 | | 18
18 | | 

30% of respondents implicitly prefer greenspace without SuDS
48% of respondents explicitly prefer greenspace without SuDS

More insight from the preferences of individual respondents

Similar number of individuals implicitly preferred SuDS and implicitly preferred No-SuDS = overall neutral average (could this be due to the people we surveyed)?
Nest steps: investigating preferences for SuDS in Newcastle

Site 1. Near SuDS (Newcastle Great Park)

Site 2. Near greenspace (Benton, near Northumbria University Coach Lane Campus)

Q1. Does the local environment influence implicit and explicit preferences for SuDS?
Q2. Do explicit and implicit preferences differ among members of the public?

Market research company conducting surveys in January 2019 (~250 responses)
IAT vs. feeling thermometer Newcastle survey (n = 94)

38% implicitly and explicitly prefer greenspace without SuDS

Without SuDS (implicit)
- 4 With SuDS (explicit)
- 18 Neutral (explicit)
- 38 Without SuDS (explicit)

Neutral (implicit)
- 3 With SuDS (explicit)
- 9 Neutral (explicit)
- 13 Without SuDS (explicit)

With SuDS (implicit)
- 5 With SuDS (explicit)
- 6 Neutral (explicit)
- 3 Without SuDS (explicit)
Public green spaces that contain SUDS (sustainable urban drainage systems)

Please spend one minute studying the following images of public green spaces that contain SUDS (sustainable urban drainage systems)

25 seconds remaining

Continue

If the E and I keys do not work, click the red X. If the red X appears, press the other key.

Your IAT score suggests that you have a preference for public green space with SuDS.

46 people have completed this test so far and the average score was 5.67.

Your IAT Score is 6.66

https://afternoon-dusk-80317.herokuapp.com/
Acknowledgement

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