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Community cognitive and affective perceptions of land-based and ocean wind energy infrastructure

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ABSTRACT

In this research, we compare and synthesize results from two separate survey projects concerning community perceptions of wind energy. In particular, we are comparing and contrasting cognitive and affective (emotional) responses. One survey is a nationally representative sample of the United States and looks at land-based wind technology wherein we also compare pre- and post-project construction move-in samples. The other is a case study of the coastal communities in Rhode Island, USA in relation to the Block Island Offshore Wind Project. Because the project is near shore to the island population and farther ashore from the coastal population, we compare and contrast models of each. Both projects rely upon the use of regression methods with the former utilizing linear regression and the latter utilizing ordered logistic regression respectively. We find that among all models presented across the two projects, affective variables like anger and fear have a distinctly strong relationship to project attitudes including support or opposition. Developers, policymakers, and other agenda setters should fully embrace that emotional perception is going to play a role in community perceptions and that the incorporation and understanding of this is likely to make a difference to the public.

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Figures and tables

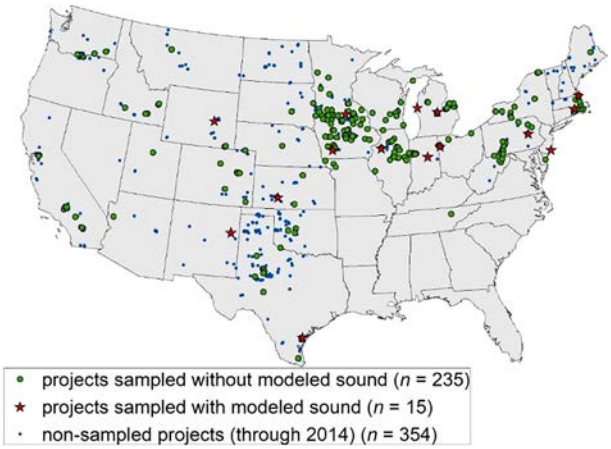

Fig. 1. Map of land-based wind power projects sampled in this research. Green points represent projects sampled without modeled sound. Stars mark projects sampled with modeled sound. Blue points mark non-sampled projects. Adapted from Russell and Firestone [1].

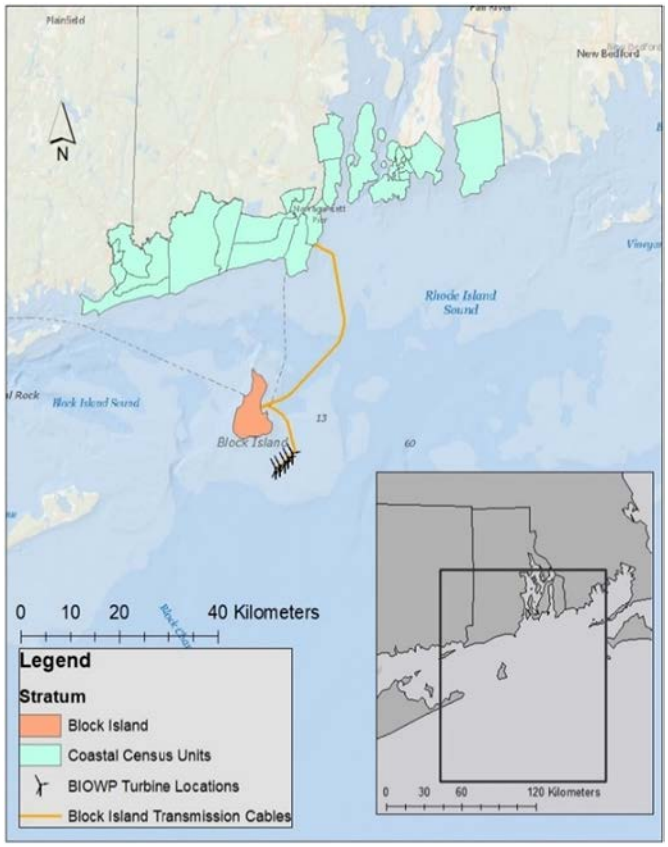

Fig. 2. Map of block island offshore wind project and survey strata. This map shows Block Island Offshore Wind Project with associated turbines and undersea transmission cables. Orange marks Block Island while light blue marks the coastal census units sampled for this research. Image Credit: Aaron Russell.

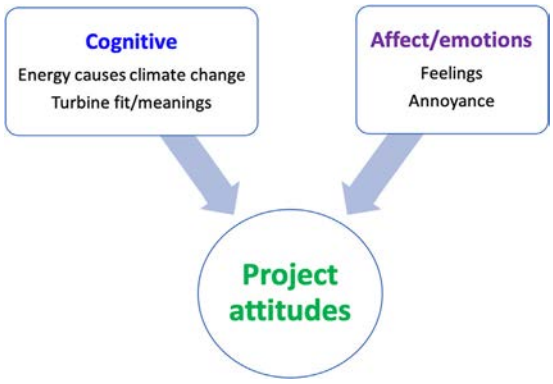

Fig. 3. Conceptual model of dual-process perception. Project attitudes are shown here being influenced by both cognitive and affective variables. Examples of each are provided.

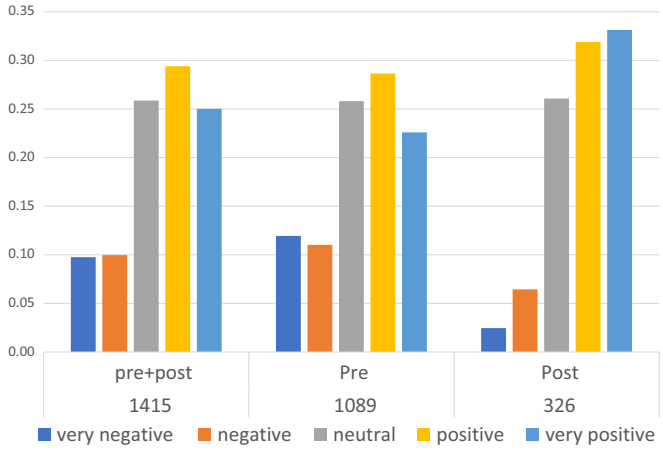

Fig. 4. Bar graph of land-based project neighbor attitudes. Attitude of respondents (unweighted) toward the local wind power project from very negative to very positive. Variations differ on whether the sample data was whether the sample/subsample includes respondents irrespective of when they moved into their local community or whether they moved in prior (pre) or subsequent (post) to construction commencing. Adapted from Russell and Firestone [1].

Table 1
Table of land-based project neighbor attitudes. Means with standard errors for pre- and post-construction project neighbors as well as the result of a pre-post move-in t-test of means.

Pre-Construction	Post-Construction	Pre/Post Mean (t-test)
3.39 (0.03)	3.87 (0.06)	<0.001

Table 2
Table of support proportions for Block Island Survey. Proportions are shown for each of the support categories as well as asterisks (*) denoting statistically significant differences.

Position	BI	Coastal RI
	2018	2018
Oppose	11%*	5%
Undecided	7%	26%*
Support	83%*	69%*

CRediT authorship contribution statement

Aaron Russell: Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Jeremy Firestone:** Funding acquisition, Project administration, Software, Supervision, Validation, Writing – review & editing.

Data availability

Data will be made available on request.

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Declaration of interests

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Since 2010, Jeremy Firestone has held various roles in First State Marine Wind, LLC, (FSMW), a private corporation that is majority controlled by the University of Delaware (UD). FSMW owns and operates a 2 MW wind turbine adjacent to the UD's Lewes campus and sells energy to UD and to the city of Lewes, Delaware. Aaron Russell claims no conflicts.

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Further reading

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