



HOW TO ENGAGE HOUSEHOLDS IN ENERGY DEMAND RESPONSE SOLUTIONS?

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The outset: Demand response within the smart energy field

- Demand response: Time-shifting energy consumption of households
- Expected to play a key role in balancing consumption and intermittent renewable production
- Active involvement of households
 - Direct time-shift of daily activities
 - Accepting (automatized) demand response programmes
- So far limited impact with dynamic pricing demand response
 - Time-of-Use tariffs: 3-6% reductions of peak hours
 - Real-Time Pricing: Similar or lower
 - Critical Peak Pricing: 13-20%
 - Peak Time Rebate: ~10-20%

Faruqui & Sergici 2010, Darby & McKenna 2012.

Research question

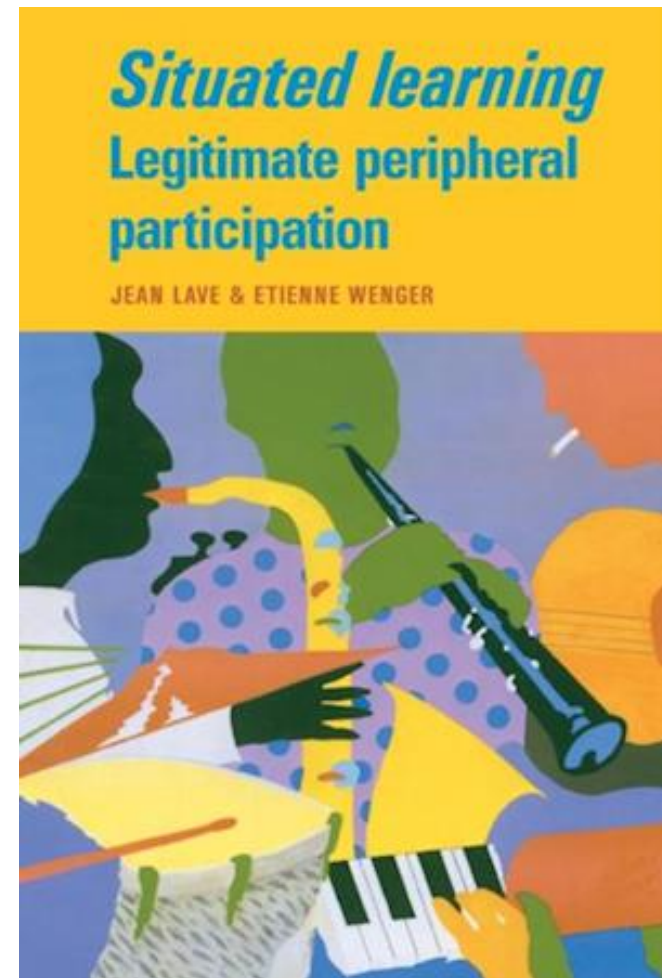
- Assumptions
 - New methods to involve households are required – price alone will not do it.
 - Energy consumption is integral part of performing everyday practices \Rightarrow time shifting involves changes in the timing of people's daily practices
- Question: What role might learning play in realizing demand response solutions based on active involvement of households?



*This study is part of the H2020-project
“Integrated demand Response Solution
towards energy Positive
NeighbourhooDs” (RESPOND)*

Learning

- Learning understood here as both
 - Self-reflection about own habits
 - Appropriation of new practices
- Learning as a socially embedded activity (“situated learning”, cf. Lave & Wenger)
- The interest here is to identify **types of situations and dynamics in everyday life that initiate** processes of learning



How processes of learning are initiated?

What types of situations and dynamics can initiate processes of learning and practice change?

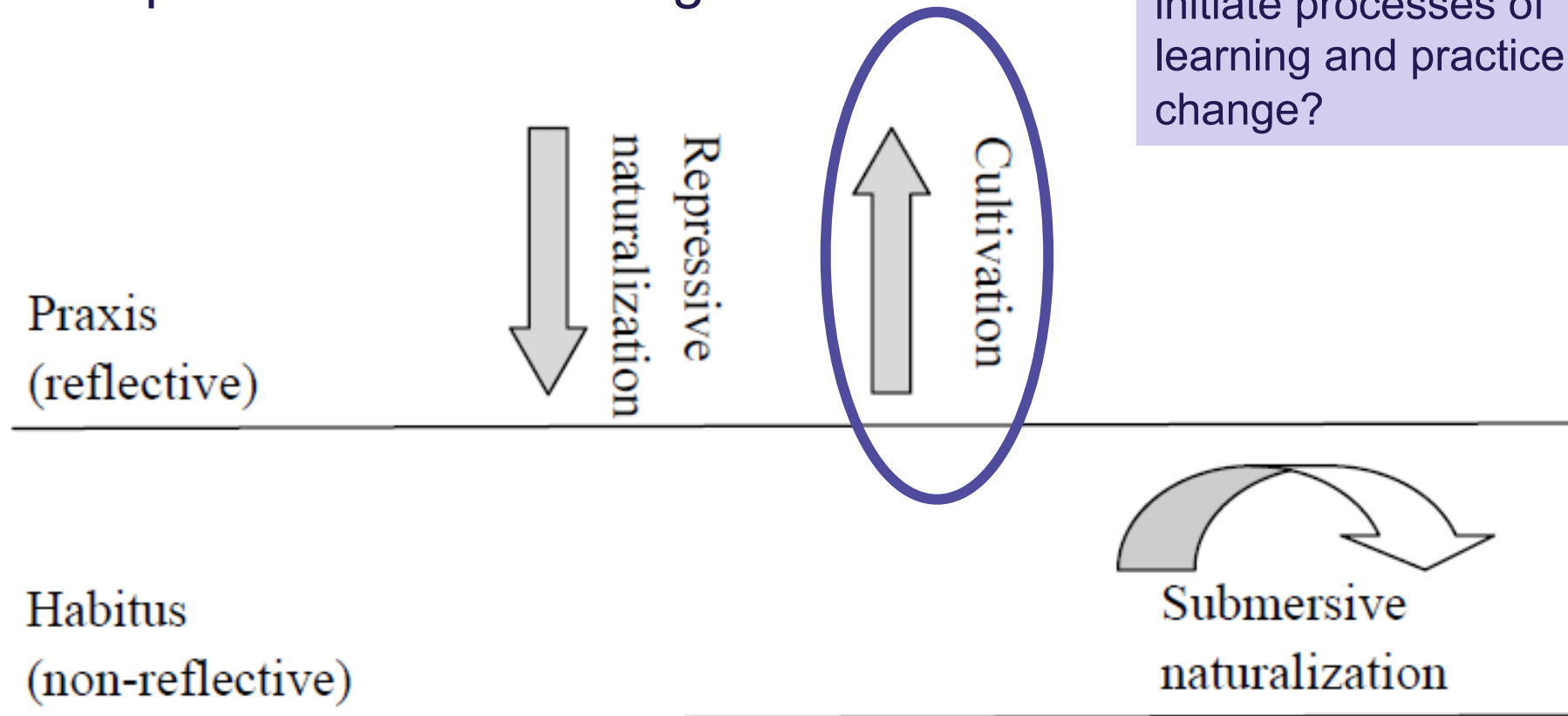


Figure based on R. Wilk (2009): The edge of agency: routines, habits and volition

Social feedback

Feedback and suggestions from other people on how to perform a certain practice, including normative judgements on the “successful” performance

To some extent applied in present DR solutions (e.g. traffic light colours conveying normative message)

Could communities and social networks be better involved in DR programmes?
Making DR a shared effort (e.g. at the neighbourhood level)?



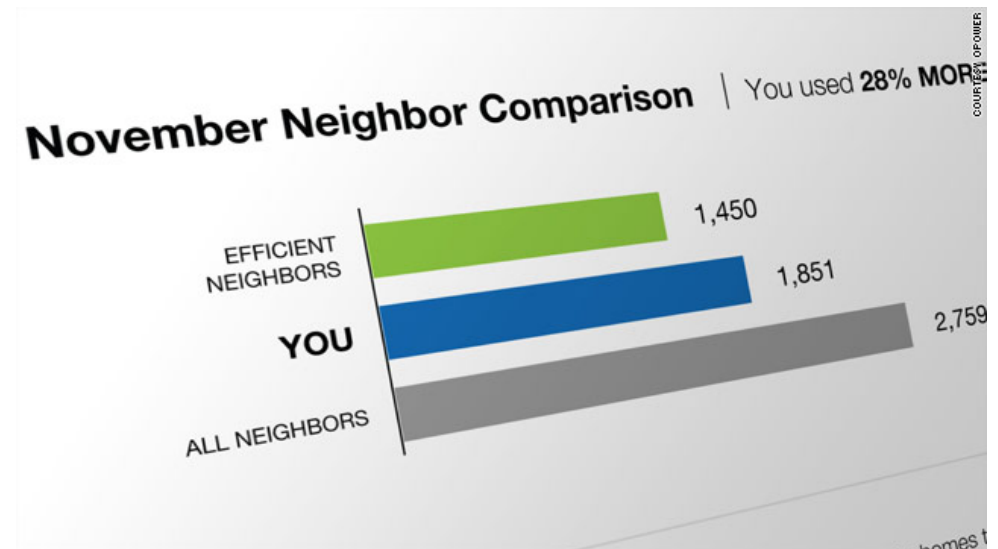
*Smart Communities trial in London –
see e.g. Burchell et al. (2014): Working
together to save energy (report)*

Encountering other people's "ways of doing"

Observing other people's ways of performing a certain practice and relate it to one's own performance (incl. descriptive social norms)

Has been applied in energy feedback, but not in DR

Home parties with local "front-runners" showing how they do DR?
Comparison of performance with neighbours?



The OPOWER Home Energy letters (energy feedback) in US – see e.g. Allcot (2011): Social norms and energy conservation

"West Oxford Energy Street Challenge" – paper by Diakonova and Grünewald 7

Material feedback

Material environments guiding the performance and evolution of practices

To some extent employed in present DR – e.g. timers to post-pone run of dishwashers or washing machines, **micro-generation** and automated DR

Design appliances and materiality of the home in support of DR? E.g.:
Machines with low noise and fire risk, visual cues, micro-generation etc.



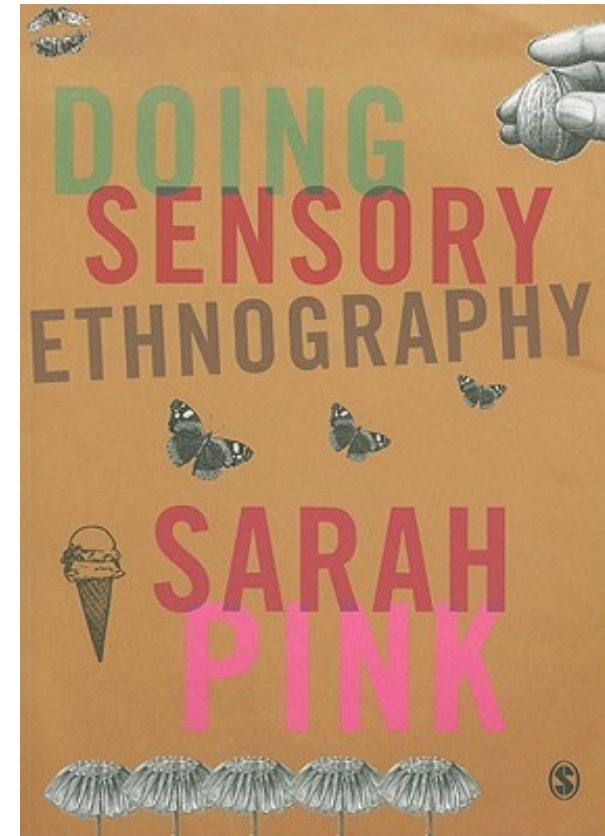
Micro-generation – “growing your own energy” (Strengers, 2013)

Embodied sensory feedback

Bodies as “self-monitoring devices” (Y. Strengers) providing feedback via our senses (visual, olfactory and tactile) and providing cues for changing practices

Not used in present DR programmes

Utilising embodied sensory feedback in DR?



Changes in the complex of everyday practices

Adopting to new practices,
discontinuation of previous practices
and changes in performance of
existing practices might imply
changes/adjustments of other co-
dependent practices

Not used in present DR programmes

Strategies targeted the development
of new practices of DR in relation to
wider everyday changes? E.g.
moving to a new home? Or people
getting retired (shift in life phase)?



Changes in conventions and shared understandings

Evolving collective conventions and understandings might challenge the performance of existing practices

Not addressed in present DR

Possible to integrate in specific DR designs? Could it be part of a broader discussion, which addresses the individual as a knowledgeable and engaged interlocuter rather than a “resource man”?

E.g. creating local energy communities with local balance of production and generation?



The Energy Babble, part of the Energy and Co-Designing Communities project, UK.

Concluding remarks

- Previous DR solutions targeted households have not succeeded particularly well
- Should DR programmes target households?
- *If so*: How can we think differently about how to design DR solutions? The current design approach based on price-intensives does not “do the trick”
- A need for speculative designs (Hargreaves, 2018)
 - But not an easy task
- Could a design targeting the initiators of practice change and learning identified in this review be a way forward?

THANK YOU FOR YOUR ATTENTION

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