



Original research article

Scale matters: Variation in perceptions of shale gas development across national, state, and local levels

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ABSTRACT

We explore the extent to which public perceptions of shale gas development vary across three survey samples—one each at: (1) national (USA), (2) state (NY and PA), and (3) regional levels (ten counties in the Marcellus Shale). We compare results from a survey of Marcellus Shale region residents ($n = 1202$) to those from a similar survey of a US sample ($n = 1625$), with an oversampling of residents from NY and PA ($n = 516$). A key difference between the local sample and the other two samples is that respondents' beliefs about impacts of development explain much more variance in support for/opposition to development in the local sample. The beliefs about development that associate most closely with support/opposition vary across scale as well. Nevertheless, a few core values are important for predicting support/opposition across all samples. These results suggest a threshold effect in that local perceptions of shale gas development do not seem to extend far beyond the counties immediately affected by development. Construal level theory and social representations theory help explain why perceptions at the local level may differ from the regional and national levels. We consider implications for communication and social science research on energy development broadly.

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1. Introduction

The relationship between proximity to energy development and support for/opposition to such development is complicated. And necessarily so. Different types of development (e.g., different energy sources, different means of extraction or generation) or different effects of development could align with varied values and experiences (present and past), thus fostering a range of reactions across individuals within a community and across communities. Prima facie, it lacks all nuance to claim that proximity to development alone increases or decreases support for development. Indeed, Jacquet [1,2] showed, in a study of residents near wind farm and natural gas development, that proximity to development had little correlation with support/opposition in respect to either energy source. In a review of research on perceptions of shale gas development, Davis and Fisk [3] conclude, 'living in a state with ongoing fracking activities is not associated with attitudes toward use or regulation' (p. 10). Whilst Boudet and colleagues [4] reveal a significant positive correlation between residence in a shale play and support for shale development, they acknowledge that this

is more likely a reflection of thoughts about regional economic growth than location of residence per se. Therefore, whilst overall support/opposition may not vary systematically with distance from development, the ways in which people characterise this issue are almost certainly associated with proximity due to variations in social discourse, the ways in which people experience development, and how people cognitively process near versus distant issues.

1.1. Theoretical approach

This study relies on two key theories, construal level theory – an individual-level psychological theory – and social representations theory—a societal level social-psychological theory. Whilst some scholars may view these theories as divergent, we maintain their combination strengthens our ability to understand the ways in which people (individuals) and society (collectives) might characterise shale gas development (hereafter 'SGD') by giving explicit attention to a range of cognitive and social structural factors that prior research has established are relevant to characterisations of SGD. Research has shown high reliance on news media for information on SGD specifically [5–14] and a strong effect of shared communal history and identity on perceptions of energy development broadly [15–21], which indicates the relevance of societal

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discourse in perceptions of development. Nevertheless, individuals' own personal experience and individual cognitions also undoubtedly contribute to characterisations of development [1,2,22–25]. We therefore bring together aspects of social representations theory and construal level theory to interpret the ways in which proximity to SGD could affect: (1) which impacts people see as associated with development and (2) the strength of the relationships between those perceived impacts and support for/opposition to development.

1.2. Construal level theory

Construal level theory maintains that people only concretely experience the local and current, whilst they form 'abstract mental construals' (p. 440) of spatially, temporally, and socially distal objects and events [26]. This means that for objects and events perceived to be closer to a person physically or nearer in time, he/she tends to describe these objects and events with greater specificity and detail. Likewise, experiences that people consider to be socially-relevant (e.g., activities they engage in regularly or that they can directly relate to) would be thought about in a more concrete manner, with greater detail, than socially-distant experiences.

The variation in psychological distance between local, present, and socially-relatable effects/experiences of climate change versus global, future, and/or socially-foreign effects of climate change has received much attention as one potential explanation for how people think about and form positions on the issue of climate change [27–31]. Whilst the causes and effects of climate change differ markedly from the processes and effects associated with SGD, important commonalities exist. SGD and climate change both have near-term and long-term effects that can be experienced locally, regionally, and globally. There is high uncertainty associated with the magnitude of potential effects in both cases. Furthermore, the effects of both can vary widely based on physical geography and social preparation to mitigate such impacts.

Construal level theory predicts that people think differently about the same process, object, or effect based on whether they perceive it proximal or distant. Therefore, people who view SGD as close to them – geographically, temporally, or socially – could, for example, associate different impacts with development than people psychologically distal from development, because local versus national impacts (or near-term versus long-term impacts) might lead to different type of cognitive processing amongst the two groups. People physically close to SGD might think more concretely about local-level impacts; this increased attention to these impacts could lead these impacts to become more relevant when making summary evaluations of support for or opposition to SGD. Individuals with proximal and concrete perspectives are thought to attend more closely to incidental and circumstantial information (e.g., other people's opinions, communal discourse), whilst psychologically-distant individuals rely more on broad values to evaluate the same object [32].

Construal level theory explains how the processes leading to individual decision-making differ as distance to an object/process/event increases or decreases [61]. This capacity could help, in part, to explain variation in perceptions of energy development as distance from development (spatially, temporally, or socially) changes. Nevertheless, whilst individual-level factors are certainly relevant to views about energy development, radical individual-level determinism seems misplaced [33–35]. For example, van der Linden empirically demonstrates [36] that a mix of individual and social-level factors are the primary indicators of perspectives on climate change—including norms, feelings of affect, and biospheric values. Theoretically, over half a century ago Mills understood the iterative and reciprocal interactions between

society and individuals when he conceived of his sociological imagination. Mills [37] contends,

We have come to know that every individual lives, from one generation to the next, in some society; that he lives out a biography, and lives it out within some historical sequence. By the fact of this living, he contributes, however minutely, to the shaping of this society and to the course of its history, even as he is made by society and by its historical push and shove (p. 6).

Indeed, whilst some social psychologists do adhere to extreme positions on either end of the continuum – adopting positions of radical social-level determinism or radical individual-level determinism – many fall in between, recognising that whilst causality may move primarily in one direction, there will always be feedbacks for which to account [33]. Therefore, to develop a comprehensive base of theory from which to conceptualise the ways in which proximity to development could affect attendant characterisations of SGD, we complement the individual-level construal level theory with social representations theory. Social representations theory attempts to achieve a balance between societal-level and individual-level determinism.

1.3. Social representations theory

Social representations are complex ideas, processes, and objects translated into common sense that is accessible and applicable in everyday life [38,39]. Social actors create and mould social representations, as noted by Billig [40]: 'It is a central theme of the social representationists that psychological states are socially produced' (p. 42). Wagner and Hayes [39] highlight the relative import of social (as opposed to individual) processes in fostering social representations when they assert that these representations emerge via 'the translation of sociostructural and cultural conditions into individual dispositions' (p. 310). The types, content, and frequency of public discourse and communication on a topic powerfully influence the structure of the social representations that emerge from the production process [41].

Historical, cultural, and social processes contribute to the generation of social representations via two primary processes: anchoring and objectification [38,39,42]. Both processes make the unfamiliar familiar. Anchoring occurs when a community is exposed to a novel concept, process, or object (e.g., SGD). Through public discourse, the item is linked (anchored) to other concepts, processes, or objects already well understood in the community, which the community considers to be similar or related to the novel item. In this sense, the representation is truly a "re-presentation", a presentation once again, but in a modified form, of both the scientific physical reality that is the object/process, as well as of the previously held representations of similar objects/processes that the public integrated with the new knowledge [38].

After social processes and shared social memory facilitate anchoring, society and its members internalise the relationships between the anchor and the novel idea, process, or object. Of course, the degree of internalisation across individuals can vary. This variation in internalisation is one path by which the cognitive processes inherent in construal level theory could work in tandem with social representations to affect perceptions of SGD. The process of anchoring in SR theory is similar to the anchoring and adjustment heuristic, as detailed in psychological literature on heuristic processing [43], except that the anchoring in SR theory occurs primarily via social influences and processes (as opposed to almost exclusively individual ones)—due to communal discourse, social structure, institutional actions, and a shared history and culture.

Once the anchor has been set, objectification – the materialisation or reification of abstract thinking – typically occurs. We write "typically", because for some objects or processes, such as

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